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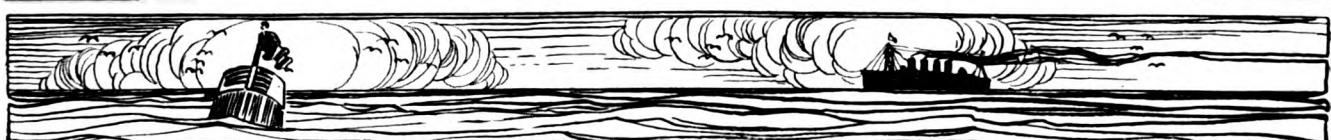
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CLEVELAND

MARCH, 1916

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No. 3

Who Are the Short Sports Now?

A Presentation of Several Entertaining Facts Regarding the Enforcement of the Seamen's Act on the Great Lakes and Elsewhere

ONE of the most significant features of the recent meeting of the Lake Carriers' Association at Detroit was the reaffirmation of the association's attitude toward the Seamen's law. This great body of leading American ship owners has put itself on record as intending to obey the law to the letter. What is more to the point, recent months have proved that the Lake Carriers mean business. The law has actually been obeyed; its provisions have been and will be enforced to the letter, regardless of the inconvenience and heavy expense such action may cause. The Lake Carriers have even gone further and have extended valuable assistance to the government officers charged with enforcing certain provisions of the law, particularly those relating to the certification of able seamen.

There has been no evasion and William C. Redfield, secretary of commerce, has publicly commended the Lake Carriers' Association for its patriotic stand.

Lake Carriers Mean Business

At their recent annual meeting the Lake Carriers reaffirmed their position as outlined above in the following language, quoting from the annual report for 1915:

"Your directors met on Sept. 29, last, to consider the bill in all its phases and it was decided to accept it as it stood and put it into effect insofar as it was possible to do so. The bill was accordingly codified, all the sections affecting the Lakes being assembled in a small pamphlet and every master supplied with a copy of it. . . . The following comment was made in the pamphlet: 'The proper and only course is for each master to use every endeavor to carry out all the provisions of the law, both in letter and spirit, in accordance with the letter of Secretary Redfield. If a master has uncertainty or difficulty through the absence of regulations or otherwise, or there comes up actual inability to comply in any respect, he should report directly to the first board of local inspectors that he can reach . . . and obtain their advice and assistance . . .'"

From the foregoing the attitude of the Lake Carriers' Association should not be misunderstood. The association fought the bill consistently before its passage and has gone on record as opposed to many of its provisions. Many individual members of the association are using every legitimate means in their power to secure extensive modifications or the complete repeal of the act as it stands. The official opinion of the association is recorded as follows in the annual report:

"It is so confusing a measure that the practical thing to do would be to exempt the lakes from its provisions altogether . . ."

Nevertheless, as long as the law stands on the statute books the Lake Carriers' Association proposes to see that it is rigidly enforced on the vessels of its members.

Where the Shoe Pinches

Now for the other side of the story. It is notorious that this law was prepared by and enacted for the union labor interests of the United States; it was fashioned particularly according to the dictates of the International Seamen's Union, represented by its enterprising president, Andrew Furuseth.

The law as enacted—at the behest of union labor—contains certain provisions covering the physical qualifications of able seamen. Unfortunately the enforcement of these physical requirements has operated to deprive a goodly number of first-class union sailors of their jobs.

The gentlemen so affected are peeved. They have registered vigorous kicks at the home office of the seamen's union. The officers of this institution, receiving the kicks, bestirred themselves and began to give out interviews, pull wires and protest against too harsh an enforcement of the physical qualifications of the law. They are still protesting.

But after all, the heart of mankind goes out to the dead game sport.

With the Lake Carriers at Detroit

Annual Meeting Was Featured by Extemporaneous Discussion, Speeches
by Telephone from San Francisco and Presentation of Watch to Harry Stone

THE annual meeting of the Lake Carriers' Association, held at Detroit, Jan. 20, was characterized by an unusually heavy attendance, including a large number of ship masters and engineers who entered freely into the extemporaneous discussions. The meeting was called to order at 11:00 a. m., by William Livingstone, the venerable president of the association. George A. Marr, secretary, and Harvey D. Goulder, general counsel, assisted President Livingstone in conducting the meeting. The tellers, Arthur Sullivan, of Chicago, and E. C. Collins, of Cleveland, announced after the roll call that 17,700 shares were represented, out of a total of 19,239. Nearly double the number of shares necessary for a quorum were represented. A resolution introduced by Mr. Goulder, authorizing an increase in

the number of directors to 40, was passed unanimously. During the discussion of this resolution Captain Denis Sullivan, Chicago, pointed out that the tendency toward decreases in the membership of the association, resulting from the concentration of the control of lake steamers, would suggest action looking toward a limitation rather than an expansion of the board of directors.

The key note of the meeting was struck in the annual report of the board of directors, executive committee and officers prepared and presented by President William Livingstone. In this report which appears *in extenso* on pages 96 and 97 of this issue, President Livingstone pointed out that in many ways 1915 was the most extraordinary year in the history of the Lake Carriers' Association. He also stated that the association faces the year 1916 with lessened membership in point of numbers, owing to the economic changes

which have been going on during the past decades. These changes reached a striking fruition in the transfers of vessel ownership that occurred during the closing months of 1915. In spite of the numerical decrease in membership, the vessel tonnage represented by the Lake

was about 1 foot less than the mean for the past 50 years. In view of this situation, the government engineers concentrated dredging equipment on Lake St. Clair during the open season and entirely exhausted their appropriation for this purpose.

The engineers hope that more money will be available for the operations to be conducted in 1916. Colonel Patrick stated, however, that the fleet may have to put up with low water on Lake St. Clair for another season. Colonel Patrick also announced that the department will station a patrol boat on Lake St. Clair to point out the deepest water and assist navigators in safely handling their vessels. Further light was thrown on the Lake St. Clair situation by Harry Coulby, president, Pittsburgh Steamship Co., Cleveland, who stated that in his opinion it now

represents the

Directors of Lake Carriers' Association

Name	Address	Business Connection
J. H. Sheadle, Rockefeller Bldg., Cleveland.....	Cleveland Cliffs Iron Co.	
H. Coulby, Rockefeller Bldg., Cleveland.....	Pittsburgh Steamship Co.	
John Mitchell, Rockefeller Bldg., Cleveland.....	Goulder, White & Garry	
H. D. Goulder, Rockefeller Bldg., Cleveland.....	Goulder, White & Garry	
W. C. Richardson, Leader-News Bldg., Cleveland.....		
J. S. Ashley, Leader-News Bldg., Cleveland.....	M. A. Hanna & Co.	
W. D. Becker, Western Reserve Bldg., Cleveland.....	W. H. Becker	
W. H. Mcigan, Leader-News Bldg., Cleveland.....	Hutchinson & Co.	
A. F. Harvey, Rockefeller Bldg., Cleveland.....	Pittsburgh Steamship Co.	
H. K. Oakes, Rockefeller Bldg., Cleveland.....		
Geo. M. Steinbrenner, Rockefeller Bldg., Cleveland.....		
R. A. Williams, Rockefeller Bldg., Cleveland.....		
J. Burton Ayres, Rockefeller Bldg., Cleveland.....	Great Lakes Steamship Co.	
W. G. Stewart, Western Reserve Bldg., Cleveland.....	Interlake Steamship Co.	
John T. Kelly, Leader-News Bldg., Cleveland.....	Richardson & Co.	
A. E. R. Schneider, Rockefeller Bldg., Cleveland.....	Cleveland Cliffs Iron Co.	
C. C. Canfield, Western Reserve Bldg., Cleveland.....	Interlake Steamship Co.	
W. M. Williams, Rockefeller Bldg., Cleveland.....	G. A. Tomlinson	
R. D. Mitchell, Rockefeller Bldg., Cleveland.....	John Mitchell	
A. T. Kinney, Rockefeller Bldg., Cleveland.....		
A. W. Thomson, Rockefeller Bldg., Cleveland.....	Wilson Transit Co.	
C. L. Hutchinson, Leader-News Bldg., Cleveland.....	Hutchinson & Co.	
E. C. Collins, Rockefeller Bldg., Cleveland.....	Pittsburgh Steamship Co.	
W. P. Schaufele, Leader-News Bldg., Cleveland.....	M. A. Hanna & Co.	
Wm. Livingstone, Dime Savings Bank Bldg., Detroit.....		
L. C. Waldo, 15 Atwater St. W., Detroit.....	Shenango Furnace Co.	
W. P. Snyder Jr., H. W. Oliver Bldg., Pittsburgh.....	Shenango Furnace Co.	
C. D. Dyer, H. W. Oliver Bldg., Pittsburgh.....		
D. Sullivan, Continental Commercial Bank Bldg., Chicago.....	D. Sullivan & Co.	
A. C. Sullivan, Continental Commercial Bank Bldg., Chicago.....	D. Sullivan & Co.	
Chas. M. Heald, Buffalo.....	Mutual Transit Co.	
W. E. Lloyd, Buffalo.....	Mutual Transit Co.	
J. J. Boland, Prudential Bldg., Buffalo.....	Boland & Cornelius	
J. B. Rodgers, Chamber of Commerce, Buffalo.....	Brown & Co.	
G. A. Tomlinson, Board of Trade Bldg., Duluth.....		
H. L. Shaw, Bay City.....		
H. S. Wilkinson, Onondaga Bldg., Syracuse, N. Y.....	Great Lakes Steamship Co.	
W. H. Smith, Montreal, Can.....	Canada Atlantic Transit Co.	

Carriers' Association continues to increase. It is true that during 1915 a number of second class vessels were removed from the list representing an aggregate of 12,952 gross tons, but this loss will be far more than made up by the first class vessels now on the stocks.

At the conclusion of the presentation of the annual report, Colonel Mason M. Patrick, district engineer, U. S. A., described the work carried on by the government during 1915 to relieve the difficulties arising from low water in Lake St. Clair. Colonel Patrick also outlined the plan of the department for continuing the improvement work in this district throughout the approaching season. He stated that the government engineers are anxious to co-operate with navigation interests in order to facilitate the movement of commerce and pointed out that during all of the past season Lake St. Clair was abnormally low. The average during 1915

weakest link in the chain of lakes. Under modern conditions, said Mr. Coulby, where each inch of draught means the addition or subtraction of 100 tons of cargo, an extra inch or two of depth at such points as the Lake St. Clair Flats canal would make a vital difference, particularly in a season such as 1916, which is expected to break all records. He suggested that the Lake Carriers' Association use its influence in every legitimate manner at its command to obtain larger appropriations for extensive dredging in Lake St. Clair.

Mr. Coulby also stated that in the interests of safe navigation it would be desirable to establish an arbitrary interval of five minutes between vessels down-bound in narrow fairways such as the Lake St. Clair Flats canal or the Livingstone channel. He pointed out that where vessels traverse these channels a quarter of a mile or less apart, representing only about a minute of

time, trouble is sure to ensue if any steamer fetches-up on the bottom. Under such conditions, rear end collisions are almost inevitable resulting in extremely expensive and vexatious delays to navigation in general. The channel is likely to be completely blockaded. At one time last year a congestion involving 100 ships resulted from vessels going aground in the channel at Lake St. Clair. Mr. Coulby suggested the erection of semaphores at the heads of the Livingstone channel and the St. Clair canal in order to control the intervals between down-bound steamers.

He also recommended a double channel at Port Huron, each waterway to be 800 feet in width instead of a single 1,600-foot channel which has been suggested. In pointing out the advantages of the double channel, he stated that in all walks of life there is always some fellow who wants to take his half of the road out right in the middle. With two channels, separated by a ridge, such a practice would be impossible and danger of head-on collisions would be absolutely eliminated.

Captain S. C. Allen, Pittsburgh Steamship Co., chairman of the Lake Carriers' Association committee on aids to navigation, stated that his practical experience led him to prefer two channels at Port Huron instead of a single 1,600-foot waterway. He also said that owing to the unsatisfactory conditions on Lake St. Clair, the light keepers should be provided with telephones which would permit them to communicate with authorities in Detroit and Marine City in case of grounding or other accidents.

Boats Run Too Close

In further discussion of Mr. Coulby's suggestions, Capt. T. E. Murray, of the Cleveland Cliffs Iron Co., Cleveland, stated that in his opinion the boats have been permitted to run too close together in the Livingstone channel. He agreed with Mr. Coulby that where steamers are only a quarter of a mile apart they have little opportunity to avoid a rear end collision in case of grounding. Owing to the fact that the vessels travel at different speeds, Capt. Murray recommended that navigation through the canals be regulated according to distance rather than time, stating that if the vessels are kept a mile apart serious accidents will be avoided. In an informal rejoinder, Mr. Coulby stated that he preferred a definite time interval on account of the difficulty of estimating distances.

With reference to the proposed improvements in the vicinity of Port Huron, Capt. Ralph J. Lyons, Great Lakes Steamship Co., Cleveland, stated that in his opinion the channel at the rapids should be widened 200 feet and

that this work was more important than the establishment of two channels opposite Port Huron. The discussion was closed by the passage of a resolution introduced by Mr. Goulder directing the committee on aids to navigation to investigate the subject thoroughly and report to the executive committee.

Welfare Results Gratifying

In his report as chairman of the welfare plan committee, J. H. Sheadle of the Cleveland Cliffs Iron Co., vice president of the Lake Carriers' Association, stated that the human element is the most important feature in a consideration of the relations between the employer and the employed. Continuing, Mr. Sheadle described the gradual drawing apart of employer and em-

passenger steamships operating under the American flag. The new law provides that vessels 600 to 800 feet in length shall have 24 buoys, of which 12 must be luminous. These buoys cost \$3.82 each with an additional \$3.50 for lights. The cost of fitting out a 600-foot freighter with ring buoys under the seamen's act, therefore, is \$133.68.

There is some doubt, Mr. Smith stated, whether the inspection service will require the installation of an oil room aft, in addition to the regular oil locker forward. He pointed out that waste cans equipped with self-closing covers are required, although it has been demonstrated that spontaneous combustion never occurs in waste soaked in petroleum products. Mr. Smith also outlined briefly the general features of the Alexander bill introduced in congress on Dec. 14, 1915. This bill deals with the equipment and management of the engineers' department on the shipboard in considerable detail. The speaker also deprecated the present practice of leaving so many details up to the option of the local inspectors. Although the steamboat inspection department is complaining that it has insufficient men to conduct its operations properly, at the same time it is spreading out and continually attempting to increase the range of its activities.

More Young Engineers Needed

Mr. Smith also urged the necessity of action to provide a larger number of assistant engineers, suggesting that this could be accomplished by amending the present government regulations.

The question of wages for the ensuing season was not taken up at the meeting, but the matter has been given some attention by members of the executive committee. However, it is quite certain that some changes will be made in the Lake Carriers' schedule for 1916. The matter will be handled by the executive committee and no action may be taken until shortly before the men go to their boats. Carrying charges were cut in 1914 and 1915 but no reductions were made in the Lake Carriers' schedule, and the men on the boats received the same wages as they did in 1913. Ore rates have been advanced 10 cents a ton for 1916 and the men will get some of the returning tide of prosperity.

The Grain Clearance Corporation, which guarantees the outturn of cargoes was operated at a loss in 1915, and wound up the season with a deficit of \$10,000. In view of these circumstances the Corporation proposed a revision of its arrangement with the Lake Carriers. Accordingly, a resolution was passed providing for the appointment of a committee to meet with the Grain Clearance



HARRY STONE

ploye in the period of industrial expansion following the civil war. He explained that misunderstandings began to develop with the complex relations created by the employment of thousands of men and told the efforts later put forth to solve the difficulties that have arisen and improve the conditions of the employed. Mr. Sheadle's remarks are reported in detail in another part of this issue.

The afternoon session was featured by a report on the activities of the steamboat inspection service in connection with the seamen's act, presented by Frank B. Smith, chief engineer, Pittsburgh Steamship Co., chairman, committee of engineers. Mr. Smith pointed out that ring buoys are now apportioned according to the length of the ship, without regard to the trade in which the vessel is engaged. A 600-foot Great Lakes bulk freighter, therefore, must have as many ring buoys as the largest

Corporation and also with a committee representing the Dominion Marine Association in order to formulate a new agreement. The Clearance Corporation reported an average shortage of 27.9 pounds per thousand bushels on its 1915 operations.

A resolution was passed earnestly urging widening the Livingstone channel to 450 feet. The present width is 300 feet. A resolution also was passed recommending improvements to the channel at Port Huron.

The retiring officers were all re-elected and the association's affairs will be conducted as heretofore under the direction of William Livingstone, president; J. H. Sheadle, vice president; George P. McKay, treasurer; George A. Marr, secretary and assistant treasurer, and Harvey D. Goulder, general counsel. Incidental changes were made in the directorate to bring the membership up to 40 in accordance with the resolution passed at the meeting. A complete list of the directors appears elsewhere in connection with this report.

The program at the annual dinner which was held at the Statler Hotel, Thursday evening, Jan. 20, was opened by an invocation by the Reverend Samuel S. Marquis, D. D., of Detroit. President Livingstone acted as toastmaster and the principal speakers included the Hon. Henry D. Estabrook, New York City; Charles F. Marvin, chief of the weather bureau, Washington, D. C.; Alexander Johnston, deputy minister of marine of Canada, Ottawa, Ont., and Harry Stone, of Marine City, Mich., chief engineer of the steamer J. W. RHODES.

Long Distance Speeches

The guests at the banquet also listened to informal remarks over the long distance telephone by men prominent in maritime affairs in San Francisco, Cal., including Capt. Robert Dollar, J. J. Tynan, general manager, Union Iron Works Co., M. H. DeYoung, publisher and editor, *San Francisco Chronicle*, and J. K. Lynch, president of the American Bankers' Association and of the First National Bank of San Francisco. Previous to making the connection with San Francisco, moving pictures of the transcontinental telephone line were shown. All of the speakers extended hearty greetings to the Lake Carriers' Association. Capt. Dollar, who talked with Harvey D. Goulder, expressed himself in a characteristic fashion regarding the seamen's act. Mr. Tynan, who talked with A. C. Pessano, president, Great Lakes Engineering Works, Detroit, stated that in his judgment steamship prices will go still higher and that American ship yards may look forward to an extended period

of prosperity. Mr. Tynan also said that the labor situation on the Pacific coast is satisfactory and that he had recently been obliged to refuse a contract for a large steamer, because he was unable to offer better than 22 months delivery. Messrs. Lynch and DeYoung, who talked with President Livingstone, expressed themselves as confident of a continuation of the present era of prosperity.

Outstanding among all events at the annual dinner were the emotions evoked by the presentation of a gold watch to Harry Stone, chief engineer of the steamer J. W. RHODES of the Becker fleet. No man more worthy of such recognition could be found and the occasion gave rise to those intimate and

papers after a single winter's schooling. During the sailing season of 1915, Mr. Stone prepared a series of 100 questions and answers in marine engineering for the *Bulletin* of the Association. So natural was their sequence and so exhaustive their character that competent engineers have declared they form in themselves a most invaluable text book. The work must have practically monopolized Stone's leisure aboard ship during the season and it was this service that prompted the Association to present him with a gold watch.

Stone began his reply to the presentation speech of President Livingstone with a song that he had written on board RHODES last summer. Two verses of this song are published herewith, together with liberal extracts from Mr. Stone's remarks, which follow:

Reply to the Presentation Speech

"Mr. president and gentlemen of the Lake Carriers' Association, I must be frank with you. I am a working man and have always been a working man, and there is an appropriate sphere for my activities. Although I realize that I am talking to workers, I must admit that I cannot appropriately express my gratitude to you for this valuable present, and much less for the good will which prompted the gift; neither can I hire any one to do it as well as I wish it to be done. But I know from observation and personal experience with the Lake Carriers' Association, that it is made up of gentlemen who exercise forbearance to a marked degree, and I trust you will extend your forbearance to me on this occasion.

"You have given me this watch for merit, real or imagined, which reminds me of Bobby Burns'

"Oh, wad some power the giftie gie us
To see oursel's as ithers see us!"

"So do I. I wish I could see myself as you see me. Who am I that the vessel owners of the Great Lakes should create an occasion to give me a gold watch, and make Jan. 20, 1916, the 'White Letter Day' of my life?

"But the matter has a phase which invites more sober thought. I hope that I have been some help to young people during the past 40 years, for I have tramped hundreds of miles through snow, mud and slush, through the country, to do what little I could to help. I have also often provided my pupils with books and shoes to enable them to attend school, and have conducted classes at their homes with no expectation or thought of reward. But it is all coming back to me now increased ten fold.

"I understand you have given me this watch as a token of your appreciation

Verses by Harry Stone

Sung by Mr. Stone at the Annual Dinner
Our harbors, lakes and rivers are all ablaze of fire,
And we send our signals fore and aft by telephonic wire;
Come along, come along, and make no delay,
Come from every steamship, come from every bay;
Steam ahead my sailor boys, and never drop astern,
For the L. C. A. is kind enough to help us all to learn.

The size of ship and engine is making rapid strides,
And we should win promotion to soon become their guides;
Square root learned with decimals, will expedite our lay,
And the L. C. A. extends to us a willing hand to pay.

involuntary touches of nature which make the whole world kin. Henry D. Estabrook of New York, a lawyer of some prominence, had just concluded a wonderful speech, admirably set in language rich, copious, of a steady, even flow and delivered in a voice as flexible and smooth as velvet; but its effect was as nothing compared to the halting, broken sentences and tear-choked voice of Stone.

This old man (for he is now over 70) has set an example of usefulness which it would be difficult to equal. In the twilight of life he is bending all his energies to impart his practical knowledge to the young men about him. Stone was himself denied all early advantages and the memory of the bitter struggle to teach himself how to read and write is with him yet. His burning desire—and the word is used advisedly for it really amounts to a flame within him—is to help the young man, who has had no early advantages, to help himself.

Stone's real service to lake interests lies in the rapidity in which he can qualify young men to obtain their papers. He is a natural-born teacher as is shown by the fact that practically 50 per cent of his pupils obtain their first

of, and good will for, my efforts in trying to assist young men in whom you are interested to improve their intellectual condition, and I assure you, gentlemen, that I value your good will far more highly than any present which your money can buy, although I shall always prize this watch many fold more than its intrinsic value, because it is a token of the good will of the members of the Lake Carriers' Association.

The desire to encourage good works, is the noblest attribute of humanity, and it is this disposition of the Lake Carriers' Association which commands my affectionate regards. It is the spirit which extends a helping hand to the weak. It is the spirit which demonstrates man's humanity to man and is the spirit which sympathizes with distress.

"And I assure you, gentlemen, backed

by faith in the impregnable promises of our Lord, that your unselfish interest in promoting the welfare of your 12,000 or 15,000 employees, by your liberal financial remuneration for their services, and better still, your extending to them facilities for improving their intellectual condition, thus instilling a sense of self-reliance and ability to more abundantly provide for themselves, shall have its reward."

Report of Protective Association

AT THE annual meeting of the Great Lakes Protective Association held at the Statler Hotel, Detroit, Jan. 21, the necessity for the continual exercise of the utmost caution in navigating steamers was emphasized. Inasmuch as the association carries a substantial portion of the insurance of its members on a

was entirely satisfactory, inasmuch as present computations indicate a profit of 18 per cent. The executive committee, however, expressed itself as being by no means satisfied with this result, since in its opinion many of the accidents which occurred were avoidable, materially influencing the financial result.

At the opening of the season it was believed that it might be necessary to increase the amount of insurance carried, on account of the disturbed conditions abroad making it impossible to cover the 75 per cent placed in the open market at a reasonable rate. No such difficulty, however, was experienced, and the association continued to carry a quarter of the risk. It is doubtful if any change will be made during the coming year. The final settlement of this question, together with the amount of the initial contribution, was left to the advisory committee and no definite action was taken at the annual meeting.

The roll call at the meeting indicated that 698,233 tons were represented out of a total of 779,912 tons. Therefore, 89½ per cent of the tonnage was represented, this being far in excess of the amount necessary for a quorum.

Advisory Committee Re-elected

The advisory committee was re-elected intact, including J. S. Ashley, J. H. Sheadle, W. C. Richardson, C. L. Hutchinson, Harry Coulby, C. D. Dyer, R. A. Williams, John J. Bolland, William Livingstone, D. Sullivan and W. H. Becker. As heretofore, the following officers were selected for the ensuing season: J. S. Ashley, chairman; W. C. Richardson, treasurer; Harvey D. Goulder, counsel, and George A. Marr, secretary and attorney-in-fact.

As indicated in the accompanying table, the report of the operations for 1915 show a surplus of \$55,325.90, which is equal to about 18 per cent of the net contributions, as against 42 per cent in 1914. However, the

rate of initial contributions for the past season was 0.25 per cent below that of 1914, which partly accounts for the reduced earnings. Also, two steamers were lost in 1915 and there were no total losses in 1914. The steamer WESTERN STAR, which was wrecked in Georgian Bay, may be added to the total losses for 1915.

Inside and Outside Courses

"It is very gratifying to the association to know that the separate courses on Lakes Huron and Superior have been generally adopted by the Masters of our vessels, and the absence of head-on collisions on these lakes is apparent as a result. Navigators generally are to be commended for their carefulness in observing these courses—and all the more so because no specific issue has been made of it during the last year by the association. No accident chargeable to any deviation from this rule by any of the vessels has occurred during the year. In this connection it is with regret that we mention the Wahcondah-Choctaw collision on Lake Huron, which we consider was caused by one of the interested vessels failing to comply with this rule. However, the accident brought forcibly before the Canadian owner the advantage of the separate courses, and within a short time after this occurrence the Dominion Marine Association adopted them without reservation for the vessels enrolled in its membership. Undoubtedly separate courses will eventually be made imperative for all vessels navigating the lakes."

mutual basis, the length of the accident list has an unusually direct bearing on the assessments levied to cover losses, and the organization, therefore, has become a powerful factor in promoting safer operations.

The association has been in existence for seven years, during three of which 25 per cent of the risk has been reserved from conventional insurance and carried by the association itself. From a purely financial standpoint, the season recently closed

She was insured for about \$200,000. At the close of the year there were 163 vessels of 779,912 tons in the membership of the association. On these vessels 168 certificates of insurance were written covering an aggregate risk of \$40,038,828.

Following is an abstract of the annual report which was read at the Detroit meeting:

"In comparison with 1914 the result has been distinctly retrograde though

the committee is mindful of the fact that there were more vessels in commission in 1915 than in 1914 and that, moreover, the bulk of commerce was moved during the last half of the season of navigation, thus unavoidably increasing the congestion of vessel tonnage. This is not to be construed as an apology that better results have not been obtained but it is seized upon as an occasion to emphasize the principles for which the association was founded—and that is the elimination of the avoidable accident. Subscribers should both individually and collectively impress their masters with the fact that taking undue chances may result in the loss of the use of the vessel if not the

gating 4.86 per cent of the entire loss. In May there were 14, aggregating 9.03 per cent of the entire loss. In June there were seven, aggregating 4.60 per cent of the entire loss. In July there were 10, aggregating 4.24 per cent of the entire loss. In August there were eight, aggregating 5.95 per cent of the entire loss. In September there were 18, aggregating 23.59 per cent of the entire loss. In October there were 20, aggregating 18.22 per cent of the entire loss. In November and a few days in December there were 34, aggregating 29.51 per cent of the total losses.

"Of the 122 accidents so far reported, seven occurred in April; 14 in May; seven in June; 10 in July; seven in

below that of 1914. Contributions were made payable in two installments, the first payable 30 days after delivery of the certificate and the second payable Sept. 15. The lake time clauses did not vary from those adopted in 1914 with the exception that a rider was added, both by the underwriters and by the Protective Association, providing for sailings earlier in the season of 1915 so that vessels might be able to navigate from noon, April 1, 1916, should ice conditions warrant, at pro rata of the yearly navigation rate. The lake time clauses will govern, particularly the ice clause providing that the assurers on all vessels, sailing during April and December, are to be liable only for the excess of 3 per cent on the entire value of the ship in respect of all claims arising from damage by ice, except claims for total or constructive total loss.

"The rider contained the privilege for post season trips, which was an innovation highly desired by owners of insured vessels as it placed them in a position to contract for cargoes in competition with the uninsured fleets and with the full knowledge of the rate of insurance which would be required by the underwriters. The rates named by the underwriters were as follows: Navigation after midnight, Nov. 30, one voyage only, warranted sailing not later than Dec. 5, 0.5 per cent; warranted sailing not later than Dec. 8, 0.75 per cent; warranted sailing not later than Dec. 12, 1.00 per cent; warranted sailing not later than Dec. 12, port to port in one lake only, 0.25 per cent. A maximum rate of 1 per cent was named covering all voyages commenced after Nov. 30, midnight, and before Dec. 12, midnight.

"The underwriters were reluctant to grant these privileges but in consideration of the improvement in operating conditions and the sharp reduction in the number of accidents during recent years they finally agreed to them, confident that masters and vessel owners would lend their best efforts to minimize losses during the period. The result has been very gratifying to the association as there were practically no losses under these extensions though two vessels outside the association, were badly damaged.

Membership of the Association

"During the season of 1915 there was no change in the rules regulating the eligibility of subscribers so that the association so far as subscribers are concerned remained practically intact. During this fiscal year there were, however, a number of changes in which vessels were taken over into fleets carrying their own insurance. During the fiscal year of 1915, 214 vessels were entered

Accidents Reported During Sailing Seasons

Nature of accident.	1909	1910	1911	1912	1913	1914	1915
Strandings	54	9	14	31	20	18	30
Groundings	128	60	42	30	19	21	28
Collisions	125	88	66	50	52	15	26
Striking obstructions	25	17	8	12	10	2	2
Striking locks	5	1	2	2	1	..	..
Striking bridges, docks, breakwaters, buildings, piers, lock-walls, piling, buoy lights, canal walls, harbor and channel banks	48	40	38	38	30	22	28
Fire damage	3	1	4	..	..	1	1
Explosions .....	..	1	..	..	..	..	1
Stress of weather	9	2	..	2	4	..	1
Machinery damage	12	1	4	1	3	2	..
Rudder damage .....	..	4	5	1	1	..	..
Wheel damage .....	..	4	7	..	..	1	3
Bent and broken quadrants .....	..	1	2	..	..	..	..
Boiler damage	2	..	..	..	..	1	..
Collapsed decks	2	..	..	..	..	..	..
Cargo heating	1	..	..	..	..	..	..
Legal expenses	2	..	..	..	..	1	..
Lost anchor	1	..	1	..	..	..	..
Ice damage	1	..	..	..	1	..	..
Salvage Assn. fees	5	..	..	..	..	..	..
Unknown	1	..	..	..	..	..	..
Broken deck winches .....	..	..	1	..	..	..	..
Loading rig fell on deck .....	..	..	1	..	..	3	..
Broken quadrant and rudder .....	..	..	..	1	..	..	..
Cargo shifted .....	..	..	..	1	..	..	..
Ran over wreck steamer Joliet .....	..	..	..	1	..	..	..
Lost rudder .....	..	..	..	2	..	..	..
Flooded: Open sea cock .....	..	..	..	1	..	..	..
Dented plate .....	..	..	..	1	..	..	..
Twisted rudder stock .....	..	..	..	1	..	..	..
Gas explosion .....	..	..	..	1	..	..	..
Personal injuries .....	..	..	..	..	..	2	..
Mooring damage .....	..	..	..	..	..	3	..
Total losses	4	6	3	1	9	..	2
Totals	428	235	198	177	150	92	122

total loss of the structure when its services are most in demand.

"In partial losses we have had merely a fair result throughout the year. The season started out sluggishly and was well advanced before all of the vessels belonging to subscribers were in commission. To be exact 98 vessels started out in April; 27 in May; 13 in June; 11 in July; 14 in August and five in September, a total of 168 vessels. The partial losses increased as the season advanced, 47.73 per cent of them occurring in October and November. These increases prove conclusively the need of the utmost vigilance on the part of the navigator during these two months. It does not pay to take any chances whatever when the natural hazard of navigation is at its maximum.

The losses in April were six, aggre-

August; 17 in September; 20 in October and 40 in November and December.

"The post season's operation was quite gratifying as only one trifling accident, involving the loss of \$2,500, occurred. This feature is quite gratifying to the committee as it probably means a continuance by the regular underwriters of the present arrangement covering sailing after Nov. 30, which is of special advantage to insured ships in chartering ahead.

"The association continued during the season of 1915 to reserve 25 per cent from conventional insurance as in 1913 and 1914. At a meeting of the advisory committee held April 14, 1915, the rate of initial contribution for the year was established at 3.25 per cent net pro rata for the year which was 0.25 per cent

in the associate membership division of the association. Annual dues of \$10 per vessel were charged to cover their proportion of the cost of the expenses of the association. Copies of all circulars, printed matter and the various issues of *The Bulletin* were forwarded to associate members as well as to regular members. The associate members are subject to the same rules and regulations as the regular members of the association.

"The careful observance of these rules by the associate membership has, in the judgment of the advisory committee, contributed largely to the successful carrying of their own insurance.

"The Dominion Marine Association advanced the suggestion of separate courses on Lake Superior from Whitefish to Fort William and Port Arthur, and also to Jackfish, suggesting that during a fog up-bound vessels pass to the northward and down-bound vessels to the southward of Caribou Island. The principle being in conformity with the ideas of this association, we very gladly took the matter up, with the end in view of carrying out this suggestion. Upon deliberation, however, it was thought that in case a vessel had set its course in fair weather and then encountered a fog, it would be difficult and rather dangerous to change its course to comply with the rule, and the committee suggested to the Dominion Marine Association that the separate courses be adopted for general use in both fair and foggy weather.

"The matter was favorably referred to the Lake Carriers' Association, which considered the subject at a special meeting of its board of directors. President Livingstone issued a circular, requesting masters to follow the courses during the balance of the season, when the entire matter would be brought to the attention of the committee on aids to navigation at its session during the winter of 1915-1916."

Membership and Tonnage During 1915 Season

"At the close of the fiscal year of 1914 there were 179 vessels in the membership of the association, with gross registered tonnage of 849,848 tons. Of these the following vessels were withdrawn from the membership by agreement with the termination of their 1914 certificates:

Frank H. Peavey.....	5,002
George W. Peavey.....	4,997
Frederick B. Wells.....	4,897
F. T. Heffelfinger.....	4,897
Ontario.....	5,494
Champlain.....	5,494
Valcartier (nee W. H. Mack).....	3,781
Amazon.....	3,702
Polynesia.....	3,640
Australia.....	3,845
Price McKinney.....	5,250
Total tonnage	50,999
"Three steel steamers cancelled	

their membership during the current fiscal year:

Merida	3,329
Charles L. Hutchinson.....	6,377
St. Clair	5,494

Total tonnage 15,200

"These vessels were lost:

Choctaw	1,573
Onoko	2,164

Total tonnage 3,737

"The following 163 vessels are now in the membership of the association:

	Gross
	No. tonnage
Steel steamers	152 753,695
Steel barges	5 13,281
Composite steamers	3 6,278
Wooden barges	2 4,811
Wooden steamer	1 1,837
Total	163 779,912

"On the 163 vessels in the membership, the association has written 168 certificates of a valuation aggregating \$40,038,828. Of this the association assumed 25 per cent, or \$10,009,704."

Complaint of Service

By Harry H. Dunn

Alleging that if the Morgan line of steamships gave New Orleans merchants the same service for the same relative charge which it gives to Galveston, Texas, it would reduce freight bills \$50,000 a year, merchants and business men of New Orleans recently appeared before the merchants' and manufacturers' bureau of the New Orleans association of commerce, urging that the steamship company be divorced from its owners, the Southern Pacific Railroad Co. The occasion for the hearing arose when the Morgan line asked for an extension of wharf space and other added privileges on the publicly-owned water front of New Orleans. The steamship company made these requests through the railroad company which declares that its operation

1915 Financial Operations

PROTECTIVE ASSOCIATION'S STATEMENT (APPROXIMATE).

Navigating contributions to Dec. 1, 1915.....	\$266,471.89
Early ports risks.....	5,460.10
Extensions into port.....	2,316.09
Post season trips.....	32,491.20
Interest on deferred payments.....	191.70
Interest from depositaries.....	1,933.13
Less cancelled certificates.....	\$ 568.96
Less lay-up returns.....	5,841.80
	<u>\$ 308,864.11</u>
Expenses of the association to Nov. 30, 1915, estimated on pro rata of the year's expenses.....	\$28,741.00
(Actual expenses \$24,342.02)	
Claims paid to Dec. 1, 1915.....	69,627.79
Claims adjusted and not paid.....	1,567.66
Claims expected, estimated.....	\$159,691.00
Less expected recovery on one loss.....	12,500.00
	147,191.00
Or indicating a surplus of.....	\$ 55,325.90
Equal to 18.292 per cent of the net contributions.	

Death of Capt. Evans

Edward Evans, a Great Lakes captain whose services on the lakes covered 41 years, died recently in Chicago. He was born at St. Joseph, Mich., in 1859 and became a sailor when 14 years of age. At 25 years he became a master, handling vessels for the S. K. Martin Lumber Co. until that firm discontinued business, when he became captain of ferries from South Chicago to Peshtigo, Mich. Subsequently he sailed W. P. REND until 1908. He was master of the steamer CITY OF PARIS for five years, and in 1913, with several associates, bought the ship. Captain Evans remained in active service until his final illness.

The Eckliff Automatic Boiler Circulator Co., Detroit, announces the appointment of W. H. Pierson & Co., 103 Grand Trunk Dock, Seattle, Wash., as the sole representatives of the Eckliff company in the Pacific northwest. This district includes the entire coast line north of the Columbia river.

of the steamship line does not, in effect, constitute a violation of the federal statutes. At a recent hearing in the rooms of the board of port commissioners of New Orleans, representatives of the Southern Pacific were told that, instead of an endorsement from local business men for the requested privileges, a delegation probably would be sent to the New York hearing to ask that, in justice to New Orleans, the Southern Pacific be divested of control over the steamship company.

Describes Products

The Chicago Pneumatic Tool Co., Fisher building, Chicago, has issued a vest-pocket size, 16-page bulletin describing its extensive line of air compressors and oil engines, suitable for shop and marine use. The booklet includes descriptions and illustrations of stationary, horizontal, steam, belt and motor-driven air compressors, portable electric-driven compressors, compressors mounted on skids, etc.

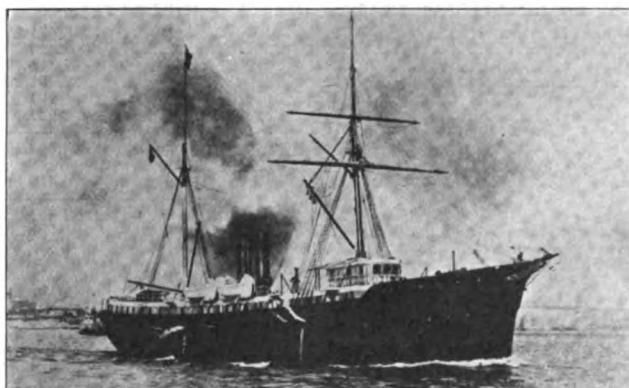
Photographs From Far and Near

Contributions For These Pages Are Solicited



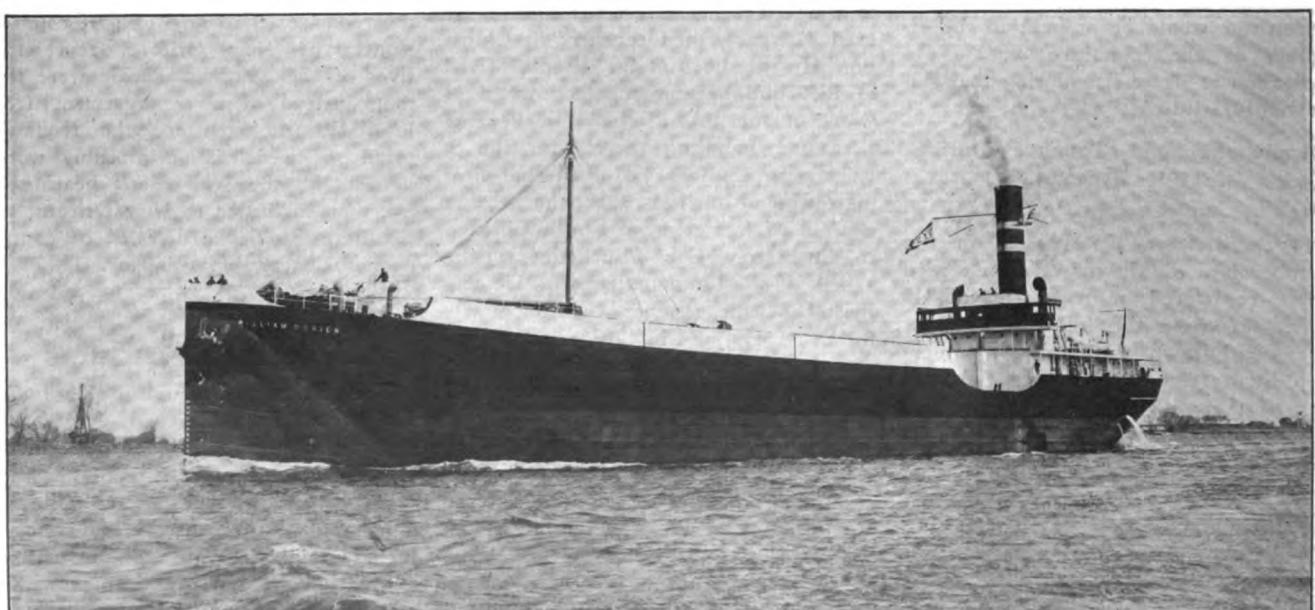
THE Isthmus of Panama reasserts itself

From a navigator's point of view, the heap of mud shown in this illustration, taken at the scene of the slide in the Gaillard cut, is just as effectual a barrier as if General Goethals and his men had never existed. It will take some time for affronted nature to adjust itself to the new state of affairs, when such slides will cease for good



THE SAILORMAN'S PRIDE VS. THE EXIGENCIES OF WAR

FREDERICK, formerly the famous HUDSON of the old Cromwell line, which, ever since her building in 1874 by Pusey & Jones at their Wilmington yards, was noted for her grace and handsome performance, experienced a sad change when war demands made it necessary to convert her into a munitions freighter. The two illustrations depict her, in her old time trim beauty and later, after being cut down to accommodate the deck load of motor trucks which are seen being loaded aboard.

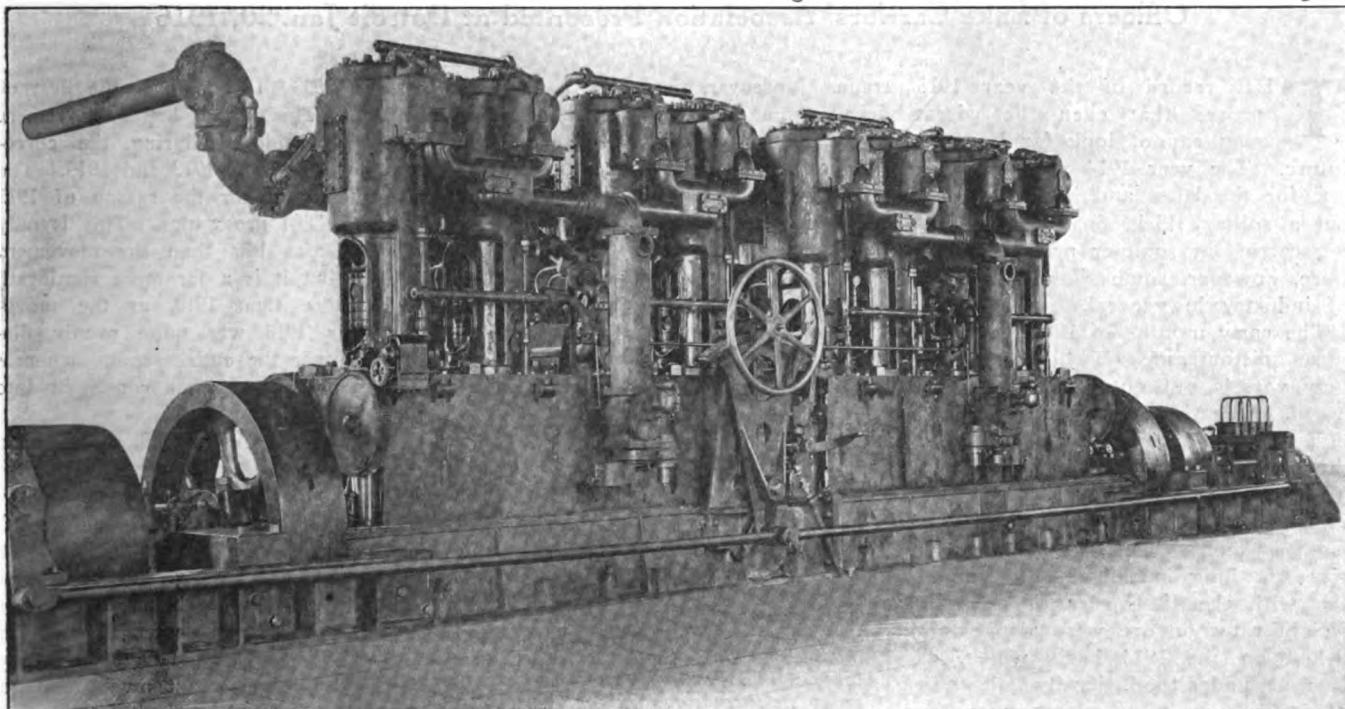


HERALD OF A DECIDED IMPROVEMENT IN THE LUMBER INDUSTRY

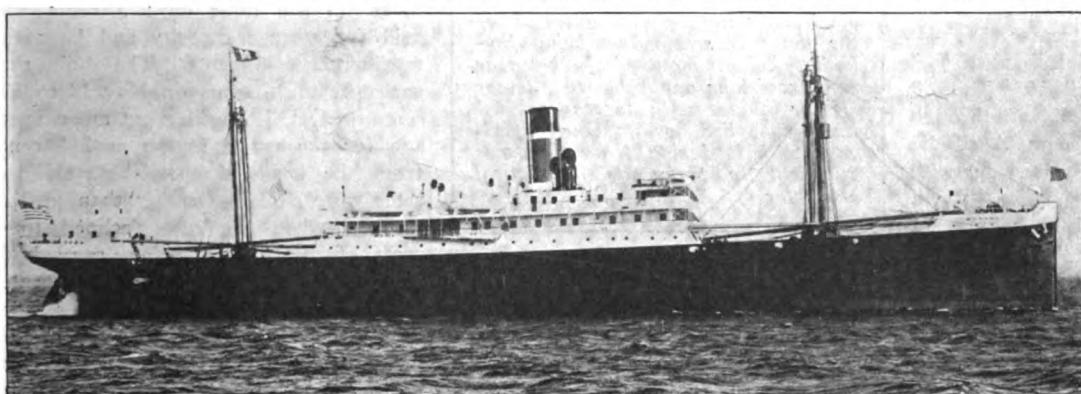
WILLIAM O'BRIEN, which was built for the Carpenter O'Brien Co., by the New York Ship Building Co. at its Camden, N. J., yards, is now engaged in the lumber trade between New York and Jacksonville, Fla. She is 361 feet in length, with a molded beam of 51 feet, a molded depth of 27 feet, a draught when loaded of 21 feet 6 inches, and a gross tonnage of 5,535.

Latest Marine News in Pictures

Payment Will Be Made For Acceptable Photographs

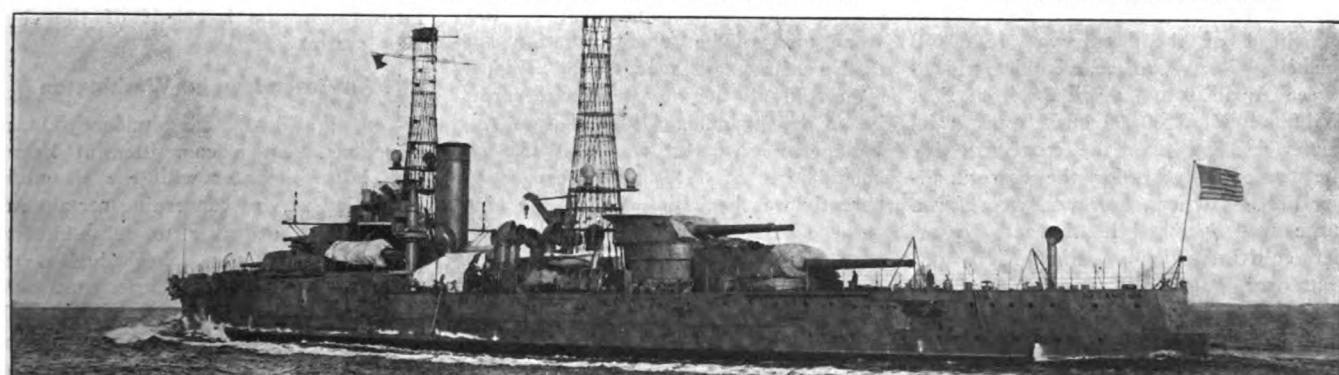


SAID TO BE THE BIGGEST MARINE GASOLINE ENGINE EVER MADE
This 8-cylinder 600-horsepower engine, which weighs 120,000 pounds, was built by the Union Gas Engine Co., San Francisco, for the passenger and train ferry RAMON, a description of which was published in *The Marine Review*, December, 1915. The engine, which is 45 feet long, is coupled to a propeller at each end of the ship, through friction clutches, doing away with the need of reverse gears.



A SPLENDID NEW MEMBER OF OUR COASTWISE MERCHANT MARINE
Built by the Maryland Steel Co., Sparrows Point, Md., MUNAMAR, a handsome 4,000-ton steamship designed for both freight and passenger accommodation, is now in the service of the Munson line between New York and Antilla, Cuba. She is 368 feet in length with a 47-foot beam and a 27-foot draught, and has a speed of 15 knots per hour under load.

UNCLE SAM'S BIRD PROTECTOR
U. S. S. THETIS, once a Dundee whaler, patrols the Hawaiian group, Laysan, Midway, and other island possessions in the interests of the government bird reservations.



ON HER TRIAL TRIP, OKLAHOMA DID 21.47 KNOTS PER HOUR
While this is well in excess of the speed required under her contract, it is not fast enough, according to many naval experts, to cope with the swift-heeled, hard-hitting battle cruisers which are winning such a reputation in the present war. Should we continue to build superdreadnaughts such as OKLAHOMA, or not? The big fighter was constructed by the New York Ship Building Co., Camden, N. J.

A Year's Progress on Great Lakes

Extracts From Report of Board of Directors, Executive Committee and Officers of Lake Carriers' Association Presented at Detroit Jan. 20, 1916

THE record of the year 1915 proves that even the wisest man cannot look far into the future. The year 1914 was a dismal one for the lakes and it ended without a solitary kick, final cargoes being carried at summer prices. There were, however, some signs of revival of industry in general.

The early months of 1915, however, were discouraging in the extreme. Few vessels put out upon the opening of navigation, and many remained in port without turning a wheel until the summer was well advanced. The price of ore was established on April 21 on the 1914 schedule, but the buying movement, which started in April, was not long sustained. In sympathy with the 1914 price of ore, the freight rates on ore were also established on the 1914 basis which, as is well understood, hardly allows a profitable margin of operation to the ship.

No vessel left Lake Erie on the opening of navigation, April 15, though weather conditions were quite favorable. However, the steamer W. H. DONNER cleared from Toledo with coal for Lake Michigan April 16. The oil tanker RENOWN passed down through the Straits of Mackinac on April 17, and the steamer CHARLES HEBARD, with grain from Duluth, locked down through the Davis Lock on April 18, having experienced but very little trouble in the ice. The Canadian Sault opened for business on April 16, locking through the Canadian steamer J. A. MCKEE, upbound. It was not, however, until April 20 that navigation was officially opened from Fort William.

How the Grain Season Opened

When navigation opened the accumulated stocks of grain at all elevators at the head of the lakes was 17,000,000 bushels. Forty-two vessels cleared between April 20 and April 24 from Fort William with 3,500,000 bushels of grain, somewhat less than the movement for the preceding year for the corresponding time. Advices, however, were for a large crop during 1915, the acreage under cultivation being estimated 25 per cent over that of 1913.

By May 15 a number of carriers were ordered to dock owing to scarcity of cargoes at both ends of the route. Shippers were having difficulty in having their own boats employed in the ore

trade. Moreover, there was not a sufficient grain movement to take care of tonnage even at rock bottom rates. While the grain rate opened at 1½ and 1¾ cents for April loading at the head of the lakes, tonnage was chartered for Buffalo on April 29 at 1 cent. Chartering was lifeless on account of the high price of grain and indications were for a very quiet summer.

By July 18, the change in the ore trade had become quite marked. Car-

ger 27,593,501 tons after the first of August. This is a better movement than was achieved during the corresponding month of 1912 and 1913. The total movement for the season of 1915 was 46,318,804 gross tons. This is only 2,781,674 tons less than the movement of 1913, but it is a far more significant performance than 1913, as the movement for 1913 was quite evenly distributed over the entire season, whereas the 1915 movement was congested into a few months.

During August grain shippers began offering 2¾ cents from the head of the lakes to Buffalo for the last half of September. This was the best rate offered during the year up to this date, but it did not last long. The rate shot up rapidly, 3¼ cents being offered for the last ten days of September and 3¾ cents for the last half of October. These rates did not bring out much tonnage, as vessel owners were not in position to take much grain. By Sept. 30 the grain market had become absolutely a runaway one, the rate changing several times on the same day; 5 cents was paid for storage capacity and later the rate went to 6 cents. The daily rate varied from 7/8 cents on May 12 to 5½ cents on Oct. 1, working out at an average for the entire season at 2½ cents from the head of the lakes. Higher rates were paid in October than in November, when the rate declined to 4 cents, final cargoes being carried in December at 5½ cents. No such rates had been freely paid on the lakes since the days of small ships. This condition was brought about by the great pressure of the ore trade and by the congestion of grain at upper lake ports, 105,000,000 bushels more grain being shipped through Lake Superior elevators during 1915 than 1914, the increase being largely thrown into the last half of the shipping season.

An Interview in Washington

Your president, acting under your instructions, sent a committee in February, last, to confer with the steamboat inspection service concerning certain rulings and to endeavor to get additional inspectors for the lakes during the early spring months. Little encouragement for additional inspectors was given the committee and members were urged to lessen the delay of inspection as much as possible by fitting out their boats earlier than usual. This practice

was followed and a number of vessels were fitted out as early as February. Additional inspectors were finally sent, however, but notwithstanding all that could be done there were scores of vessels that had not undergone inspection by the opening of navigation.

It is quite clear that the steamboat inspection service is overworked and undermanned. Secretary Redfield's plea for an additional appropriation and an added force should meet the earnest approval of the association.

The most important issue confronting the association is the operation of the Seamen's act, which went into effect on Nov. 4, last. Your directors met on Sept. 29 last to consider the bill in all its phases and it was decided to accept it as it stood and to put it into effect insofar as it was possible to do so. The bill was accordingly codified, all the sections affecting the lakes being assembled in a small pamphlet and every master supplied with a copy of it. The letter of Supervising Inspector General George Uhler to your president giving a ruling on the subject of coal passers, as well as the letter of Secretary Redfield to the supervising inspector general of the steamboat inspection service relative to the enforcement of the Seamen's law on the great lakes, were also included.

Keep Faith With Secretary

Secretary Redfield took a very commendable stand on the whole measure. Recognizing the strain to lake commerce during the closing month of the year, he made it a matter of good faith on the part of the owners to strive as best they could to comply with the provisions of the act, intimating that good faith would go a long ways towards mitigating any possible penalty. It was obviously impossible to comply with all the provisions of this extraordinary measure but notwithstanding every member of the association did what he could to put its provisions into

effect. Thrust as it was upon the closing month of the year, it projected an almost intolerable condition into the trade.

The steamboat inspection service, already overburdened, worked with great energy to issue certificates of able seamanship to applicants. The marine hospital staff undertook the work of making the required physical examination of the sailors. Masters made it a prac-

stances would not be employed at all. The first effect of the bill was to lower the standard of personnel. This is one of its most regrettable effects. The act, too, has met with considerable hostility from those in whose interests it was ostensibly framed.

It is very gratifying to announce that the Dominion Marine Association has agreed to observe the separate courses on Lake Huron as laid down by the Lake Carriers' Association, and has instructed the vessels enrolled in its membership to follow them. In this connection also the Dominion Marine Association has laid down courses on Lake Superior for vessels navigating to and from Jackfish Bay and Fort William, the upbound vessels passing to the eastward and the downbound vessels passing to the westward of Caribou Island. The Dominion Marine Association requested that the American vessels also observe these courses on Lake Superior. The Association submitted the subject to the committee on aids to navigation as individuals, and on Oct. 5, last, your president, in a circular letter, requested that vessels generally observe these courses on Lake Superior during the balance of the season when the matter would be brought before the committee on Aids to Navigation as a committee. The committee at its meeting on Jan. 5, 1916, formally endorsed the proposition.

Increased Time Efficiency

In point of efficiency the year 1915 exhibited a considerable improvement over that of 1914 and even that of 1913. Efficiency has reached so high a state in the ore trade on the lakes that little more can be expected than a slight reduction in the time spent in port. Nevertheless the minutes continue to be clipped off. The operating fleet took on its cargoes and discharged them quicker than it did in 1913 by several minutes, but during the past decade the time spent in loading and unloading ports has been considerably more than cut in half.

Registration in 1915

Masters	396
First Mates	769
Second Mates	129
Chief Engineers	439
Assistant Engineers	624
Able Seamen	6,819
Ordinary Seamen	6,759
Total	15,935

tice to accompany their men to the steamboat inspection offices to aid them in getting their certificates, while the coast guard service examined applicants for certificates as lifeboat men. The commissioners, too, gave all the time they could to the work, but notwithstanding all that could be done, it was a physical impossibility to comply with all the provisions of the bill.

The commissioners were thrown into a perfect whirl of work. Many of the best men aboard ships left the employ altogether rather than to submit to the physical examination, while scores of experienced men who were anxious to continue in the service were found to be disqualified through some physical defect. The result was that the commissioners were put under an enormous strain to get men to complete crew lists. How great the strain was can be appreciated from the fact that 23.6 per cent of the men shipped during the entire season were shipped after Nov. 1. Obviously the ships had to take what they could get and many men were, through sheer necessity, accepted for service who under ordinary circum-

Welfare Results on the Great Lakes

By J. H. Sheadle

Chairman of the Welfare Plan Committee

THE human element is the most important feature in a consideration of the relations between the employer and the employed. No enterprise in industrial life can ever make for substantial success for any considerable period that does not take full cognizance of the personal element.

In the development of American industry, prior to 1860, we will say, the units were comparatively small. The number of men employed in any

one enterprise were few, and in the nature of things an intimate acquaintance existed between the principal and the subordinate. Such acquaintance gave the employer an opportunity to know the conditions surrounding the employee in his personal and family life, and consequently enabled him to be helpful to the employee in time of need, all of which made for a satisfactory understanding between the two individuals. This acquaintance, one with the

other, proved a safeguard in a general way against material misunderstandings, for differences among men are usually because of the failure of one, or both, to understand the point of view of the other.

Following the Civil War began the real industrial expansion in this country. The shoe and boot maker with perhaps one assistant in the hamlet or village, gave way to the larger factory where the goods were made in quantities by a large number of

men. The little forge plant was eclipsed by the more elaborate iron mill. The modest coal mine, supplying a neighborhood, expanded into a large operation.

The individual employer thus was beginning to disappear and his place to be taken by the manager or managers of corporations employing thousands of men. This change brought with it more complex relations and the individual employee came more and more to be a part of a vast industrial machine, with the result that personal interest could no longer be maintained as before between the employer and employee.

After a time, as a result of this decreasing personal contact, misun-

derstandings began to develop. Then came a period when there were many conflicts between employers and employees, with great losses to both. These conflicts still occur, but they are growing less in number, for both the employer and employee have awakened to the fact that in the great expansion of industrial life something fine was being lost in the lessening close relations between the two, and each made the discovery that both were losing the proper measure of the full rights of the other.

Eight years ago the Lake Carriers' Association began its welfare work and the results obtained have been most gratifying. While all has not been achieved and there yet remains the need of continual and substantial effort to firmly entrench the things that have been accomplished as well as to widen the scope of the work.

The safety first campaign has produced very real and tangible results during the past two years. Taking the seasons 1913 and 1915 as the best comparisons, because these two seasons were approximately the same in operating conditions, we find that the number of accidents has been reduced from 312 to 220, a reduction of 92 accidents. But what is most significant is the fact that accidents due to carelessness during these two years were reduced from 247 to 134, a reduction of 113 accidents.

I need not recount the growth of the vast business in which you are engaged—the transportation of freight on the Great Lakes, for it has passed through the same conditions that have prevailed in every other branch of industrial effort in this country. It was first individual, then greatly amplified, until the day came when it was borne in upon the men who were conducting the business that a comprehensive plan should be devised to provide for better working, physical and educational advantages for the men who are employed on the ships of the Lake Carriers' Association.

The figures covering accidents are very illuminating, for the elimination of 113 accidents due to carelessness, means that the men have become more observing, more thoughtful, and have had in mind generally dangerous places and practices. Moreover, it is obvious that the officers of the ships, particularly the mates, have been more alert, and have taught the men, both by precept and example, to be more careful.

Carelessness, however, still continues to be the leading factor in all accidents. The really unavoidable accidents are few. With another year of the present work along safety lines we ought to reduce the accidents due to carelessness to a minimum.

We must not overlook the fact that our sanitation campaign has had great weight in the general work going forward in this country in this particular. The supply dealer is but a link in this chain, but he has made long strides forward in his manner of keeping and distributing his goods. No longer is the handling of food supplies in a haphazard and careless manner accepted by the ship's officer and steward.

Improvement in Stewards' Methods

The men in the steward's department, too, have learned much in the way of stowing and caring for the supplies once they are on board. There is much yet to be done by both, and it is the duty of every owner to personally see that further improvement is insisted upon on the part of the dealer as well as on the part of the people he himself employs. The assembly rooms have proved splen-

did avenues for improvement and recreation and hundreds of men have availed themselves of their facilities.

During the past season Mr. Harrison, traveling commissioner, took many views of familiar marine scenes, depicting lake life; also many illustrating how accidents happen, showing the wrong way and the right way of performing an act. These have been transferred to lantern slides, and he has but recently commenced talks, lasting about an hour, illustrated by these slides.

The men have invariably taken to these lectures like ducks to water, because the pictures deal with scenes with which they are familiar, and which human nature never tires of seeing. Scenes in plays that are most

Commissioners Busy

The work of the commissioners is worthy of special mention. While comparative quietness existed during the earlier months of navigation, the fall months were very active, and the commissioners worked night and day to fill out crew lists and in nearly every case were successful. The new seaman's act, taking effect the first days of November, caused much confusion, as many men quit the service because of some of the provisions of the act. The extent of this can be realized when it is known that although changes in crews are more frequent in the last months of navigation than in any of the other months, 23 per cent of the men shipped during the season were shipped during November. This imposed a tremendous burden upon the commissioners, but none of them flinched, and all bore their labors cheerfully.

popular with New Yorkers are the familiar scenes about town, such as Herald Square, the Battery, Central Park, etc., and this observation is equally true of the lakes. The scenes that most appeal to the men are those they meet with in every day practice.

These lectures are being amplified in further directions; for instance, slides are now being made of scenes in the assembly rooms, showing the night class at work, the seamanship class in session, and the navigation and marine engineering classes working. In other words, following along, step by step, the various courses of education, and giving a pictorial view of the possibilities open to the young man who engages himself in the lake trade.

In going over the work of the assembly rooms themselves I have been impressed with their general helpfulness and efficiency. They have come to be real harbors of refuge to the seamen, for they not only afford a place of shelter, and a place for en-

terstanding began to develop. Then came a period when there were many conflicts between employers and employees, with great losses to both. These conflicts still occur, but they are growing less in number, for both the employer and employee have awakened to the fact that in the great expansion of industrial life something fine was being lost in the lessening close relations between the two, and each made the discovery that both were losing the proper measure of the full rights of the other.

It was natural that the employer should take the initiative and seek measures to correct this fault in industrial relations, and now for nearly two decades the intelligent employer has been studying and working to the end that new means shall be provided, under the new conditions, to take the place of the personal interest no longer possible, as it was under the simple life of earlier days.

It is not necessary for my purpose to more than refer to the great work

tertainment and profit, but they provide them with an opportunity to secure jobs, and when there is no opening on board ship they find them something to do ashore. As an illustration, the Duluth office found employment ashore for 73 men the past season when there was nothing immediately offering aboard ship.

Moreover, the men everywhere, appear to exercise an individual monitorship in their attitude toward the assembly rooms, for there has been very little disturbance and few ejections for disorder. It has come to the point where the men themselves are keeping order and are jealous of any misconduct that disturbs the normal operation of the rooms.

The Lake marine savings plan is growing annually. Commencing in 1911 there were at the end of that season 391 bank accounts in force; at the end of 1912 there were 909 accounts, with 1,145 at the end of 1913, 1,317 at the end of 1914, and at the end of last season 1,919 accounts remained in force.

The merit of this plan does not lie in the sum total deposited, but rather in the effect upon the men of the spirit of thrift. It automatically makes a different kind of men out of them. We have to get close to the individual to realize the actual work the Lake marine savings plan is doing. It cannot be gotten at by merely contemplating figures. You must get in touch with the man himself. There is a gulf as wide as the seas between the man who has money in hand and the man who is strapped. One takes a courageous front view of life because of independence, while the other takes the discouraged view of one beaten.

Besides the seamanship schools, so successfully held last winter, a number of the progressive officers on the ships conducted classes, holding sessions each trip during the season just closed, and the interest was so great that they report that never before have they had the crews of such quality as they had last year.

Maintaining Good Health

The general health of the men manning the ships this past season has been excellent, but there is one point that must be further emphasized, and that is the water supply. Areas of supply have been marked out and are well followed, but something more should be done in this direction. There should be an entirely independent piping system for drinking and cooking water tanks.

The matter was taken up by the welfare plan committee last season, and the fleet engineers committee

called into conference. The fleet engineers unanimously came to the conclusion that every ship should be so equipped.

So that there might be some data to intelligently proceed in this matter three separate owners made such an installation on one of their boats, the cost of one being \$71.63, of another \$48.19, and of a third \$107.09. It will be noted that the cost, even under varying conditions, is small.

It would seem then that with such an installation, the observance of the proper water areas, and care of the system when installed, that adequate provision would be made for a safe water supply.

The United States government public health service is now making a study of this question, and we believe that it is in the line of the progressive work of this association to lead in this matter, not follow.

How to Lay Up in Winter

THE annual report of the Great Lakes Protective Association for 1915, presented at Detroit, Jan. 21, contained some pertinent suggestions on winter moorings, portions of which are as follows:

"All vessels should be moored with good Manila lines or wire cables, sufficient in number and satisfactory to the inspector. In all exposed places and also in places where freshets or floods are liable to occur, all vessels shall use one of the anchor chains for mooring, carried to the dock with a long lead and made well fast. One anchor and chain to be at all times ready to drop.

"Winter mooring of vessels will not be approved at wooden elevators, they may be taken to the elevators for prompt loading or discharging, neither of which shall be unduly prolonged, and on completion, they must be moved well clear of the elevator and properly moored for the winter.

"In rivers and slips, where freshets are liable to occur, vessels shall be moored singly to the dock, no two being abreast. Mooring will not be approved alongside of river banks where freshets or floods are liable to carry the vessel onto the bank.

"All vessels must have a competent shipkeeper aboard at all times, except where proper day and night watchmen are in charge on the dock, whose duty it is to watch the vessels moored therat. Where two vessels of one fleet are moored close together, one ship-keeper will be considered sufficient for the two vessels.

"At old docks and docks where piling is poor, mooring will not be approved unless new piling is driven, in a manner satisfactory to the inspector.

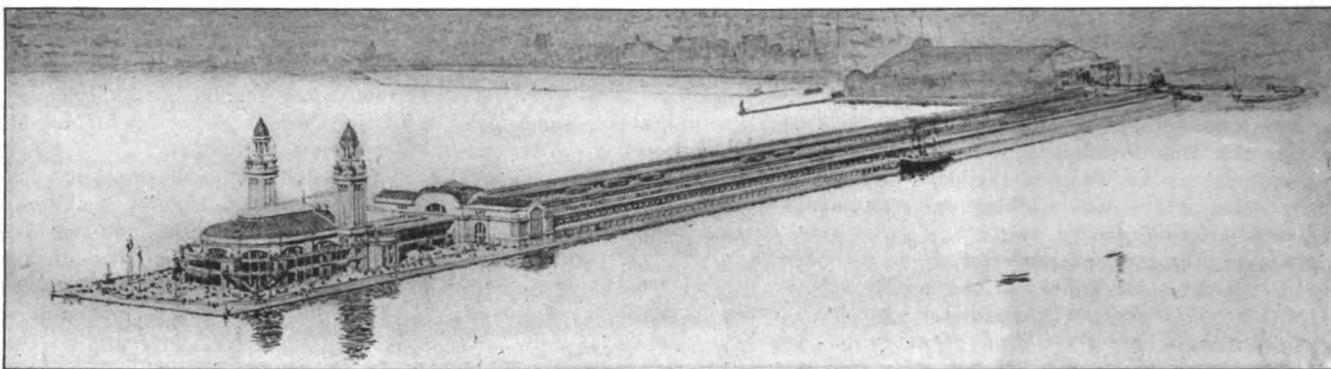
"Both light and loaded vessels mooring under the breakwater at Buffalo, shall be moored head to the breakwater, distance therefrom not to exceed 50 feet, utilizing every ring in the breakwater, which will leave the vessels approximately 50 feet apart. One of the anchor chains 90 fath-

oms long should be used forward, divided into two 45-fathom shots, run out from each hawse pipe, securely fastened aboard the vessel to the windlass. The outer end of one chain should be shackled to a ring in the breakwater. A bight of the other chain should be shackled to a ring, and one bow anchor left shackled on the end of this chain and dropped into the water close to the breakwater. In addition to the above forward fastening, a good hawser at least 10 inches in circumference (which must be practically new) should be run from each side of the bow to the rings in the breakwater and securely fastened thereto and on board the vessel; it should be so fitted that the surge of the vessel will be taken on these hawsers before fetching-up on the chains.

"The mooring aft should consist of two anchors of the same weight as the bow anchors. The bow anchor not in use may be taken aft together with 90 fathoms of chain, and an additional anchor secured. The chains should be run out of the stern chock in two parts, with bight of chain securely fastened aboard the vessel. The two anchors should be shackled to the ends of the chains and run out and dropped the full length of the chains.

Mooring by Anchors

"In the event that more vessels wish to moor than the rings in the breakwater will accommodate, such vessels shall moor head to the breakwater, not less than 150 feet apart, with two anchors down forward, and two anchors aft, the same weight of bow anchors with 45 fathoms of chain out to each anchor, provided that the position of the vessel and holding ground is satisfactory to the underwriters' representative. Under no circumstances shall a vessel not permanently moored, moor alongside or make fast to another vessel already permanently moored."



Bird's-eye View of Municipal Pier No. 2

Chicago Builds Triple Service Pier

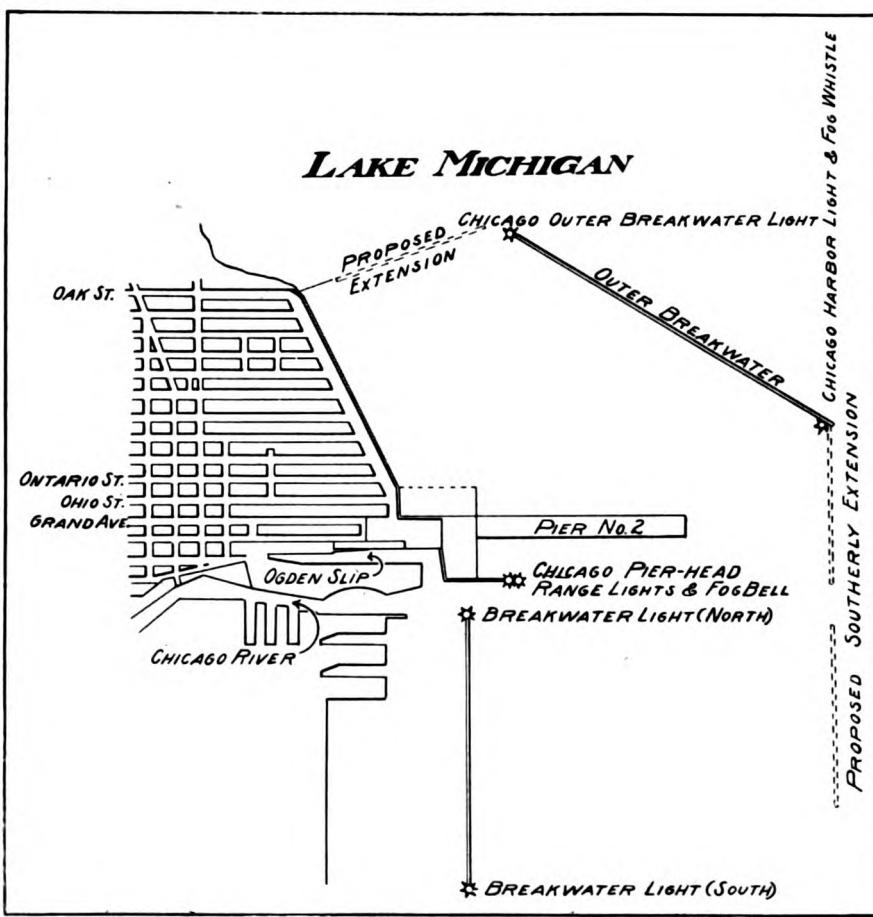
Four-Million-Dollar Municipal Utility Combines Freight, Passenger and Recreation Features—Will Relieve Traffic Congestion on Chicago River

By G. H. Manlove

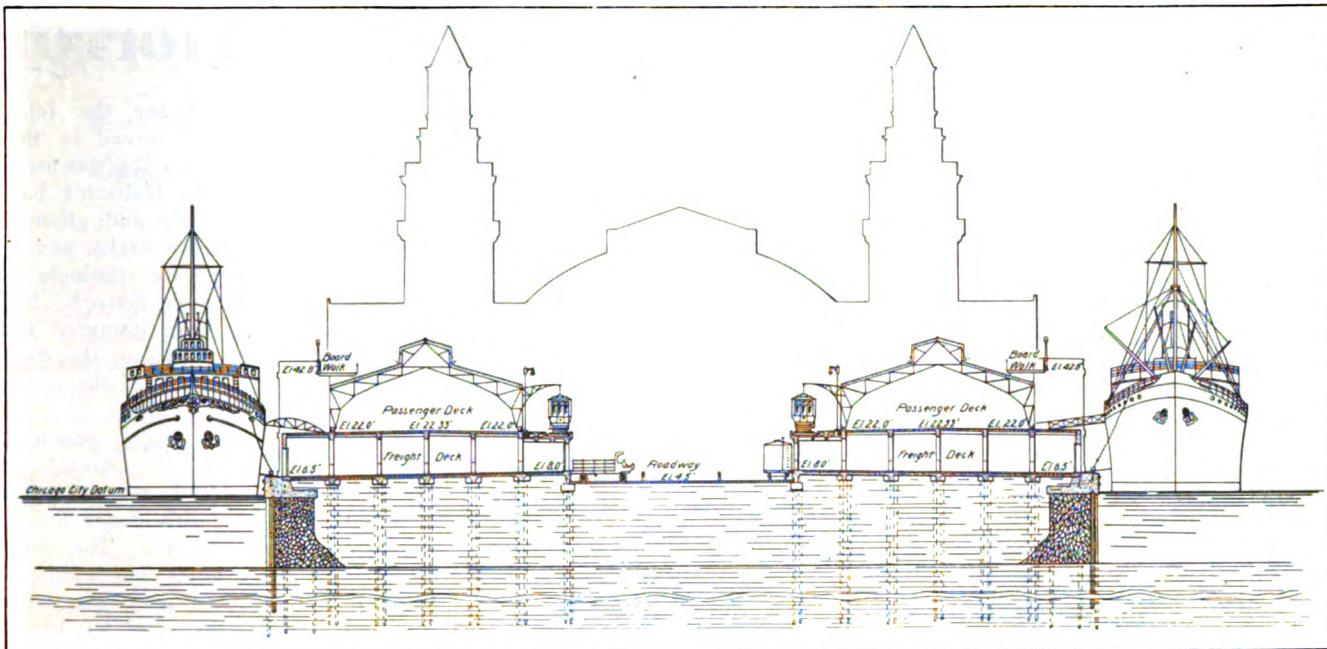
A 3,000-foot municipal pier combining freight, passenger and recreation facilities, served by railroad trains and street cars and designed to provide dockage for all sorts of freight except bulk cargoes, will be opened for the use of the public at Chicago, with the beginning of the navigation season of 1916. This great structure, which is to be known as municipal pier No. 2, is situated immediately north of the mouth of the Chicago river, and is 292 feet wide, with three decks. Its cost, when completed, will be about \$4,000,000. The Chicago harbor and subway commission is in full charge of its construction and administration. The building of this pier is the first important step in a movement to improve Chicago's harbor and to aid vessel owners and shippers in decreasing the costs of freight handling, by providing a terminal rendezvous for rail and water transportation. A comprehensive plan has been outlined for the construction of a series of piers from the mouth of

the Chicago river to a point approximately a mile north, including an area to be known as harbor district No. 1. The present outer breakwater, with a proposed extension at the north, will provide a safe harbor, permitting vessels to reach their berths and to depart, without depending upon the assistance of tugboats. As soon as the pier is completed, all

transportation lines carrying passengers and package freight will be invited to apply for space, a reasonable rate being charged. The city owns a large portion of the dockage space along the Chicago river, which is now leased to steamship companies, and no difficulty is anticipated in effecting the transfer of considerable business to the new pier. One effect of this concentration will be to lessen the present traffic congestion on several streets which cross the river. The number of boats leaving and arriving, at the beginning and end of the day, with the attendant opening of bridges, now interferes seriously with street traffic. By keeping many of these boats out of the river, much loss of time will be avoided. While steamship lines carrying on a regular business from the port of Chicago will have space reserved for their exclusive use, it is provided in the ordinance regulating the pier that 25 per cent of the total space must be reserved for the use of transient vessels, payment for this



STRATEGIC SITUATION OF NEW CHICAGO MUNICIPAL PIER



CROSS SECTION THROUGH FREIGHT AND PASSENGER BUILDINGS, MUNICIPAL PIER

privilege being governed by the amount of business represented. The remainder of the pier will be leased by sections. The pier is sufficiently large to accommodate all the craft now plying from Chicago, with a considerable reserve for the increase of commerce.

The accompanying general plan indicates the size of the pier, which is 3,000 feet long over all, with an approach of 600 feet from the former shore line. Four buildings have been erected on the pier. At the land end is the head house, containing the administrative offices, public lavatories, and ramps leading to the passenger floors. The two large ornamental towers on the pier contain gravity tanks of 60,000 gallons capacity each, which are connected to an automatic sprinkler system for protection against fire.

On either side of the pier, extending from the head house to the terminal building, is a steel freight and passenger

shed 2,340 feet long and 100 feet wide, which is surrounded by a six-foot dock way. The main floors on the dock level offer 456,300 square feet for freight space, while the passenger level contains 308,880 square feet. The terminal building provides space for the outer loop of the street railway tracks, a restaurant, an emergency hospital and a large concourse. The outer 665 feet of the pier, beyond the terminal building, will be devoted to recreation. Its plans include commodious rest-rooms and lavatories, children's play devices, a concert and dance hall 140 feet square, a refectory and several other features. The landing space on this portion of the pier will be used by steamers carrying passengers exclusively, notably those plying between the parks along the lake front. The railroad tracks will traverse the full length of the freight sheds on the lower level of the pier, the street car tracks serving the passenger deck.

On the outer side of each freight shed an eight-foot balcony promenade will be provided. The details of construction are indicated in the accompanying illustrations which show the varied uses to which the main part of the pier will be devoted.

Although Chicago's harbor needs have been actively in the public eye for 25 years, a definite course of development was undertaken only seven years ago. A harbor commission was appointed in 1908 to study the needs of the port; and in 1909 a report was made, which recommended the construction of piers between the Chicago river and Chicago avenue. In 1911 the Illinois state legislature passed an act authorizing municipal harbor works and accessories, also permitting the city of Chicago to set aside several districts for future harbor construction. The immediate development of district No. 1 was authorized, the harbor and subway commis-



CHICAGO MUNICIPAL PIER NO. 2 FROM LAKE SHORE

sion being appointed to take charge of the work.

The plans for the work were submitted in February, 1912, and in the following April, the voters authorized a bond issue of \$5,000,000 for preliminary development.

The dock itself consists of a reinforced concrete retaining wall with a concrete floor, both of which are supported on pile clusters. The space inside the retaining wall is filled with material which was dredged from the harbor; but the floor is constructed to bear its load independent of this filling, having been tested to a load of 900 pounds per square foot. The specifications called for a maximum load of only 250 pounds.

Former Bulk Freighter Now Tanker

By Hollis F. Bennett

The bulk cargo motor ship CALGARY, which recently arrived at the works of the Baltimore Dry Docks & Ship Building Co., Locust Point, Baltimore, for conversion into a bulk oil carrier, is to be used in the oil trade between Tampico and New Orleans, by her charterer, W. J. Payne, Richmond, Va.

CALGARY, and her sister ship, TOILER, were built by Swan, Hunter & Wigham Richardson Co., Wallsend, Newcastle-on-Tyne, in 1912. CALGARY is driven by two Swedish diesel motors, and is capable of a speed of approximately seven knots loaded. Both ships, which were designed for service on the Great Lakes, are owned by the Great Lakes Transportation Co., Midland, Ont. Since her coming to the lakes, TOILER's machinery has been removed and a steam plant installed in its place.

Utilize Present Tank Space

The alterations being made to CALGARY, in order to fit her for her salt water career, include the installation of three cylindrical oil tanks, 38 feet in diameter, and one similar tank, 36 feet in diameter, on the present inner bottom of the vessel. The wing space between Nos. 2 and 3 cylindrical oil tanks and the shell is also being fitted for a large cargo tank, bulkheads being built from the sides of the ship to the tanks. The three inner bottom tanks are being adapted for cargo oil carrying. A duplex cargo oil pump which is to be installed in the forward hold, forward of No. 1 tank, will have a 10-inch suction, with a branch to each circular tank and wing tank, and two 6-inch suction branches to each of the three double bottom tanks. Steam for the pump and for a 3-ton evaporator and auxiliaries which are to be installed will be derived from two boilers now in the ship.

Ocean Museum of Horror

ONE OF the oldest and strangest of occidental vessels afloat today is the former British convict ship SUCCESS, last of the "Ocean Hells" which transported murderers and vagrants, erring statesmen and pickpockets to the overseas penal colonies generations ago. Purchased by enterprising showmen, SUCCESS has been making lengthy visits in American harbors, from New York to San Francisco, Portland and Seattle. It is said that 600,000 people inspected her at New York and 850,000

ment purchased her for the felon transport trade. She served in this capacity until 1851, when she was made a receiving prison in Hobson's bay, Australia. Cells, strong and gloomy, were constructed 'tween decks, and in these the most desperate criminals of the British empire were housed. Refractory prisoners were immured for the long days and nights in the dungeons in the dark depths of the lower hold.

Black holes, in which prisoners who had been guilty of a breach of discipline were placed, were 2 feet 8 inches in width, with doors fitting as tight as iron valves. The only air in these black holes was admitted through a perforated iron disc over the door. Prisoners were so handcuffed that they were prevented from standing upright or lying down, but were obliged to stoop or lean against the shelving side of the vessel as she rolled in the restless waters of the bay.

Crosses the Atlantic

In 1912 SUCCESS attempted what was perhaps the greatest feat in all her remarkable history, when she sailed from Southampton for New York. Lloyds refused her insurance; the British government refused her clearance, and captain after captain refused her command. Captain John Scott and Capt D. H. Smith at last cleared port with SUCCESS on the same day that the ill-fated TITANIC sailed from the port of Southampton. She made port in Boston harbor in 96 days, the crew worn and half starved, but triumphant.

Will Build River Boats

The Louisville & Jeffersonville Ferry Co., Louisville, Ky., has let a contract for the construction of an all-steel ferry excursion steamer to the Howard Ship Yards Co., of Jeffersonville, Ind. It will be 200 feet long, with a 56-foot beam. The capacity will be 2,000.

Could Readily Enlarge

From inquiries addressed to some 30 or more ship yards in the United States, the New York chamber of commerce has gathered the information that within a year or more most of the ship building plants of the country, if the demand for tonnage justified it, could enlarge their capacity from 15 per cent to 60 per cent.



PRISON SHIP SUCCESS

at the Golden Gate city. Thousands of original instruments of torture, from the time of the Spanish inquisition to the days when SUCCESS was in her prime, are on exhibition in her cabins.

SUCCESS is now 123 years old, having been built in 1790 at Moulmein, "by the old pagoda lookin' eastwards to the sea." Yet this old hulk succeeded in crossing the Atlantic ocean under her own sail in 96 days. Massively built throughout of Burman teak, she was launched as an armed East India merchantman, with brass cannon bristling from her sides, and was fitted handsomely for the reception of princes, nabobs and the wealthy traders of the Orient, whose goods she carried over the seven seas. Her tonnage is 589, and she is 135 feet long, with 29-foot beam. Her hull is 2 feet 6 inches thick. With a square cut stern and quarter galleries, the vessel is stamped with the hall mark of antiquity, and her bluff bows show that she never could have distinguished herself for speed.

Success served as a merchant ship until 1802 when the British govern-

Plan Campaign for Trade Supremacy

Five Hundred Representatives of American Industries Discuss World Market Opportunities at New Orleans Meeting of National Foreign Trade Council

By H. H. Dunn

A DEFINITE plan for the coming campaign of American dollars against the pounds, marks and francs of Europe for the trade supremacy of the world was formulated at the third annual conference of the National Foreign Trade Council, held recently at New Orleans. Five hundred men, representing almost as many industries and more than as many millions of invested capital, made the session a memorable one by the earnestness and co-operative spirit which they manifested. A feature of the conference was the development of a positive sentiment in favor of the creation of a government shipping board composed of men familiar with foreign trade, to recommend to congress measures necessary to build up the American merchant marine, to maintain American standards of living and compensation among seamen, to maintain communication with distant American possession and to contribute to the national defense. Repeated emphasis of the fact that, because of obscure anti-trust laws, American exporters must singly meet combinations encouraged by foreign governments to resist American competition and depress prices of American exports, was followed by the most positive statement yet made by the federal trade commission, which has questioned 30,000 American business men on the subject, when Chairman Joseph E. Davies, of that com-

mission, declared before the Council: "Doubt as to the legality of co-operative effort in export trade is undoubtedly one of the factors which hinder development of foreign trade at this time. In the absence of

upon the participation of a steadily increasing number of smaller manufacturers, all gaining a wider market as a protection against recurring periods of domestic depression, and assuring greater stabilization of labor employment. A discussion of the tariff, avoiding controversial domestic issues, revealed apprehension that the allies in war may become economic allies in peace by means of preferential tariff agreements. It was felt that the United States, equipped as it is only with a single level tariff barren of a trading margin, should meet this post-bellum danger by a more flexible or bargaining tariff, enacted by congress with the aid of a non-partisan tariff commission.

A permanent shipping board, composed of five members, who shall be men experienced in shipping and foreign trade. This board shall recommend to congress such revision and modernization of all United States laws relating to shipping as it deems necessary and shall permanently discharge all the functions of the federal government relating thereto. This board shall constitute a permanent advisory body empowered to recommend to congress the measures necessary for the maintenance of United States shipping upon an equitable competitive basis with other nations, always having due regard for the maintenance of American standards of living and compensation, and keeping in view the needs of the national defense and the necessities of the foreign trade. To this end the board should be directed to ascertain the cost of construction and operation, rates of interest on shipping mortgages, insurance rates, etc., of American shipping as compared with that of other nations, and it should be its duty to determine what line of ocean-carrying trade shall be permanently developed under the American flag for the benefit of the foreign commerce of the United States, and to recommend methods whereby such lines may be rendered possible, in the event of the cost of their operation preventing effective competition with foreign services in the same zone.

Declares for Shipping Board

The following recommendations were drawn up by the merchant marine committee of the National Foreign Trade Council at the recent convention of the latter in New Orleans:

"That congress establish a permanent shipping board, composed of five members, who shall be men experienced in shipping and foreign trade. This board shall recommend to congress such revision and modernization of all United States laws relating to shipping as it deems necessary and shall permanently discharge all the functions of the federal government relating thereto. This board shall constitute a permanent advisory body empowered to recommend to congress the measures necessary for the maintenance of United States shipping upon an equitable competitive basis with other nations, always having due regard for the maintenance of American standards of living and compensation, and keeping in view the needs of the national defense and the necessities of the foreign trade. To this end the board should be directed to ascertain the cost of construction and operation, rates of interest on shipping mortgages, insurance rates, etc., of American shipping as compared with that of other nations, and it should be its duty to determine what line of ocean-carrying trade shall be permanently developed under the American flag for the benefit of the foreign commerce of the United States, and to recommend methods whereby such lines may be rendered possible, in the event of the cost of their operation preventing effective competition with foreign services in the same zone.

"That the board bring to the attention of congress the necessity for modifications of the speed requirements of the mail act of 1891 in special cases, so that the establishment of mail communications with South America, South Africa, Australasia and the far east may be considered from the several points of view of the cost of operation of such lines and of the speeds at which it is desirable that these lines be maintained.

"That the board so constituted shall likewise report upon the measures necessary to render investment in American shipping safe and attractive to private capital, and to increase the present resources of our systems of credit, as by the establishment of mortgage banks, to supply funds to the shipping industry for financing the construction of tonnage, and to throw around shipping mortgages such protection as to remove any apprehension on the part of investors regarding the safety of shipping propositions.

"That the President be empowered to suspend the operation of such of the provisions of the seamen's law, as he may consider detrimental to the interest of American shipping, until congress, having before it the advice of the shipping board, has revised and modernized the United States navigation laws; or if this suspension be deemed not expedient by congress, then that section 13 of the Seamen's Act be amended so as to eliminate the language test and the minimum percentages of able seamen among the deck crew, substituting therefor provisions equivalent to the requirements of the British merchant shipping act, and that the requirements of section 14 and annexed regulations concerning certified life boat men, etc., be modified in conformity with the 1914 amendment to the British merchant shipping act."

injury to any American interest, a greater degree of co-operation in export trade than is allowed in domestic trade may be beneficial to the country. If this is not now permitted by law, new legislation to that end, properly safeguarding the public interest, should be enacted at once."

Increased recognition was granted the fact that national welfare depends

of the Brazil Railways Co., that the new doctrine of Pan-Americanism, "one for all and all for one", would not become real, if Europe is allowed to remain the sole reliance for the sister republics' needs for capital.

The greatest question before the council was that of the American merchant marine and the removal of

hampering restrictions on its growth, regardless of whether the shipping industry was finally subsidized or otherwise aided for foreign trade. Discussion of this question elicited strong condemnation of the seamen's law as well as declarations that the greatest present hindrance to an American merchant marine is the "unreasoning and unreasonable" attitude of the administration.

Assistant Secretary of Commerce E. F. Sweet outlined a plan to enable naval auxiliary vessels to be leased to private interests under fairly satisfactory conditions during times of peace, and in times of war to be operated by the government for defensive or other necessary purposes.

Mr. Sweet declared in favor of the appointment of a non-partisan commission of experts to investigate the shipping question. The majority of the members of this commission, he believed, should be selected from non-official life.

Capt. Robert Dollar, president of the Robert Dollar Co., San Francisco, which has traded and operated ships across the Pacific for many years, told the convention that the reason why American business men were not now going into shipping under the Stars and Stripes in the foreign trade, as they did during the Napoleonic wars, was the lack of any definite national shipping policy. He opposed government ownership, not only in principle, but on the ground that it would not serve the true functions which a merchant marine should render to a nation.

Public Fails to Grasp Situation

"The public does not comprehend," said Capt. Dollar, "the three-fold function which shipping discharges towards a maritime nation, which is, first, a source of increased national income through the freights collected from world commerce, and the greater facilities for shipment and sale of the national products at large; second, maintenance, under the flag, of communication with distant possessions, and third, aid to defense and protection of commerce during war, whether the government is belligerent or neutral. Any national shipping policy must be designed to serve all these ends, otherwise, the United States will never have a fleet like Great Britain's."

"It is a libel upon the intelligence of our citizens to say that Americans will not engage in foreign shipping. This is refuted by the fact that previous to the war, American citizens owned and operated over two million gross tons under foreign register, be-

ing obliged to do this by the onerous restrictions of the American navigation laws, and economic conditions making cost of operation higher under the United States than under the foreign flag."

Opposes Government Ownership

Capt. Dollar gave a detailed resume of the present chaotic navigation laws. "The new government ship bill," he declared, "has not been introduced, and it would be unwise to attempt to discuss unofficial reports that, instead of being confined to government operation, the vessels constructed by the government may be leased to private companies for operation in certain trades not yet designated. This much, however, it is fair to say: The government proposes to embark in a business which normally costs 20 to 30 per cent more to conduct under the American flag than under foreign flags. Unless the government can perform the service more cheaply than private enterprises, it must incur deficits, to be met out of the public treasury. The vessels cannot be leased to private companies, unless private companies can operate them profitably."

F. D. M. Strachan, Brunswick, Ga., declared that any attempt to get the American wage scale for seamen down to a competitive level with other nations is not to be thought of, and that the only method by which the American merchant fleet in foreign trade can be built up is by the governmental equalization of costs of construction and operation.

Mr. Strachan, who has been in the shipping business a number of years, and is building a number of ships which he desires to operate under the United States flag in foreign trade, offered a constructive plan which included governmental equalization of the cost of a vessel built in an American ship yard by American labor, with the cost of a vessel of the same type in a foreign yard at the same period; a contract on the part of the government with American ship owners to equalize their operating costs over a period of years versus foreign operating costs; and the amendment of American navigation laws so that they will be on a parity with the navigation laws of foreign countries with which American-built and owned ships must compete. In return for governmental aid, Mr. Strachan suggested, the government should have the right to call on American ship owners for services of an extraordinary character, thus assuring at a very low cost the certainty of an addition to its fleet of transports or

naval auxiliaries in time of need. Welding Ring, representing the chamber of commerce of New York, heartily endorsed Capt. Dollar's views. "I have had 40 years' experience in shipping," said Mr. Ring, "but do not consider myself even now properly qualified to become a member of a merchant marine board, to tell the people just what to do in the shipping connection."

"It is not entirely practicable, under present conditions," said J. F. Fowler, representing W. R. Grace & Co., New York, "to change from a foreign flag to the American flag. The firm which I represent has indulged in experiment in this direction, by changing from British to American flags, on certain of its fleet of ocean-going vessels. The results of the experiment, particularly indicating an increase in the cost of operation, have not been such as to justify a further attempt in this direction. We would, of course, prefer to have all our ships operate under the American flag, but the existing conditions, particularly those statutory enactments, which affect shipping, are not such as to make this possible."

H. F. Griffith, representing the Westinghouse Electric & Mfg. Co., Pittsburgh, suggested that if the ship purchase bill would provide for the leasing of a government-owned merchant marine to private concerns, much of what is now considered objectionable would be removed.

Thinks Prosperity Will Continue

George B. Taylor, representing the Society for Developing of American Shipping, New Orleans, said that assuming that the maximum possible rate of construction of ships is maintained, the preponderance of freight to be moved over available transportation facilities will be so great as to render shipping exceedingly profitable for at least two years after the war. He therefore suggested, that American shippers, instead of waiting for some radical change in the situation, get busy now and build some ships, and prove that the situation is not nearly so bad as it might appear.

P. H. W. Ross, president, National Marine League of the United States, declared that "the shipping question is not merely a squabble between shippers and seamen, but one in which the entire people of the country should be interested and on which they should be heard."

Among other speakers on the merchant marine question were M. J. Sanders, New Orleans, and John A. Penton, president, Penton Publishing Co., Cleveland.

Making Chain Under Steam Hammers

By F. G. Coburn
Naval Constructor, U. S. N.

CHAIN CABLES for vessels of the United States navy are now being manufactured at the Boston navy yard under steam hammers. The process has been developed to a point where its success as a rapid and high-grade producer is unquestionable. For many years, all chain cables for naval vessels of all kinds and sizes were made at the Boston yard, with only an occasional purchase of chain under exceptional conditions. Until comparatively recently, the old-fashioned methods of chain-making were accepted and followed; but about five or six years ago a movement was begun to improve these old methods. The trade of hand-chain-making is a fairly old one, and as the industry is not large, the trade has not received much attention. The chain fires look much as they did a hundred years ago; and the chain-makers go through the same motions that their great-great-grandfathers did. Machine processes of manufacturing small chain have been invented, and are in actual use; but the quality of the product is not always equal to that of the hand-welded product—and the latter is by no means perfect. In the hand process, the scarf is formed by peening with the back of the sledge; this results in a rough, irregular faying surface, frequently with fairly large pockets. These pockets retain slag, and the unevenness of the faying surfaces brings about a separation of the surfaces which is not reduced by the hammering during welding, particularly in the large sizes. The result is that the weld is not complete; and the danger lies in this, that the edges of the scarfs are perfectly welded and smoothly finished, completely masking the bad weld. The writer has seen a link of old chain break in the test pit—chain that had been in service for several years—the break occurring along the scarf and showing both slag pockets and sledge marks. It was perfectly welded around the edges, but the inside, probably 75 per cent of the faying surface, was absolutely not welded at all. The link had never parted in service, because end-welded chain has a high measure of strength due to its form, and the additional strength, due to the welded area, was sufficient to make it stand the stresses of service, which, fortunately, were not high. Hand-welded chain is usually irregular in shape and dimensions, an important deficiency if the chain is to be veered and hove over

Hand-Welded 3-inch Chain
Which Failed in Test. Chain
is Irregular in shape and size

a wild cat. Hand welders are a bit careless in this respect, as a rule, but when impressed with the necessity of uniformity and equipped with gages it must be said for them that they will turn out very uniform chain. But whatever may be the comparative advantages and disadvantages existing between hand-welded and machine-welded chain in the small sizes, there is no question at all about the shortcomings of the hand process when applied to large chain. Large chain may be defined as chain of $2\frac{1}{4}$ inches diameter and upward. The hand welders do fairly well up to $2\frac{1}{2}$ inches, although there are plants which make hard work of anything over 2 inches; above these sizes they run into difficulties. At the Boston yard, by dint of close attention to inspection and tests, no great difficulty was had, until the $2\frac{7}{8}$ -inch and 3-inch sizes were reached, in the gradual increase of chain sizes, which accompanied battleship development. This 3-inch chain is so large that the hand welders made very hard work of it. In addition, they were actually unable to make

Hammer-Welded 3-inch Chain
Which Broke Well Above Re-
quired Pull. Chain is uniform
in shape and size

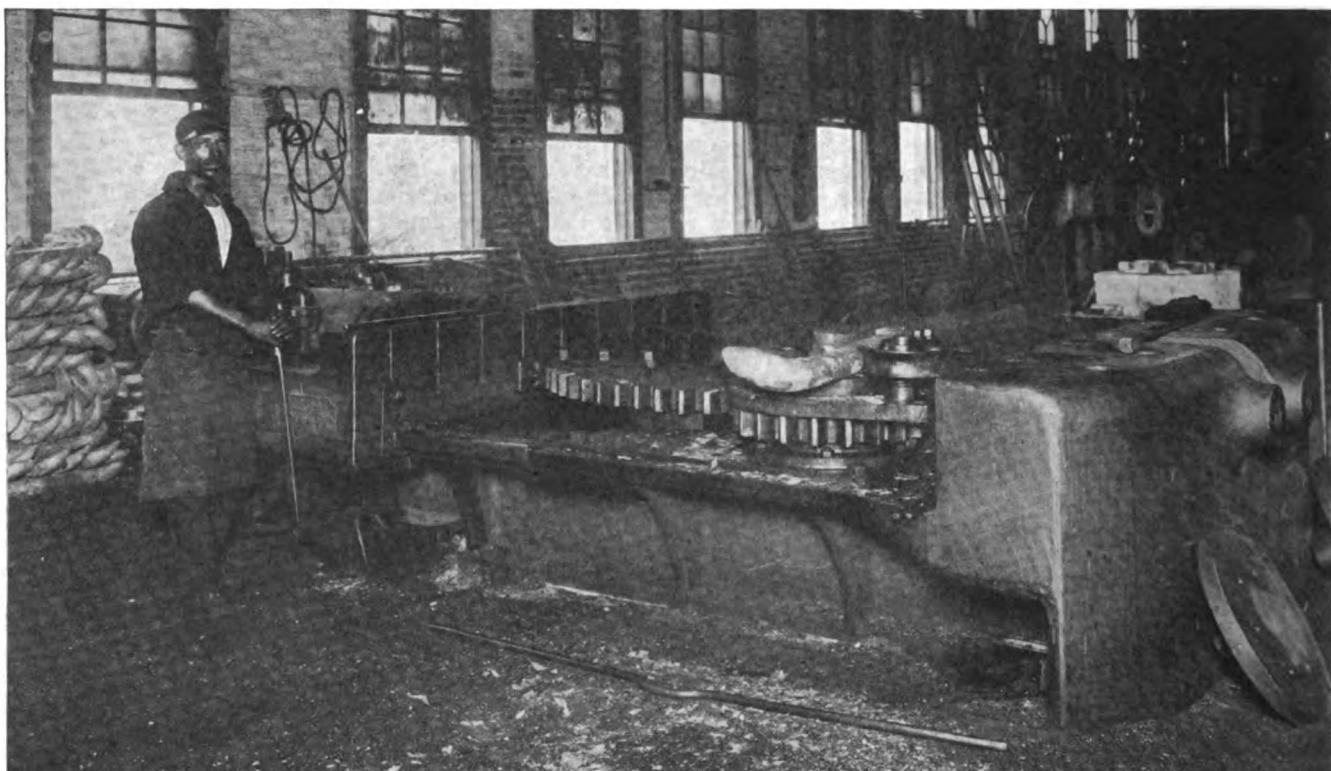
the scarfs come together truly, and could not, on account of the limitations of their tools, make a fair, round section at the weld. Finally, the problem of making the $3\frac{1}{4}$ -inch cables for the battleship PENNSYLVANIA was faced. When the iron for these cables was delivered, two sample triplets were made for testing, one triplet by one gang, the other by another gang. Each gang took a whole day to make its three links, and then stayed out all the next day to rest from its arduous labor. One and one-half links per gang per day. At that rate it would have taken one gang more than seven years to make that one set of cables. With all the capacity available in the shop for large chain work concentrated on that one order, it would have required more than a year. With the steam hammers, one gang produces 20 links of this size chain per day, every day. There seems to be no need for argument as to the advisability of going to the use of hammers. Cost would be no consideration, because the chain must be made,

and in reasonable time; fortunately, however, the cost is lower for hammer-forged chain. The same requirements as to quality are imposed for hammer-welded chain as for hand-welded chain; and actually are surpassed. The chain is uniform; all links are of the same size, a very important matter, as battleship cables are hove over wild cats which grip only a few links. The breaking stress is in excess of requirements. On some 3-inch chain, open link—that is, without studs—the test triplets from the hand welders' work broke, on the average, at about 485,000 pounds; the test of hammer-welded chain averaged about 525,000 pounds. In every way, quantity, quality and cost, the hammer welding process has

This bending operation was first done by hand, as by the old hand methods, but is now done in a hydraulic bulldozer. The mandrel around which the scarfed bolt is to be warped, is stationary. A collar around its base, carries a stud on which is mounted a flanged wheel. The outside of the collar is toothed, gearing with a toothed sector which is linked to the ram of the bulldozer. Thus when the ram comes forward, the collar is rotated around the mandrel, and therefore the little flanged wheel, carried on this collar, is moved around likewise, wrapping the bolt around the mandrel. Then the scarf's are pried apart by a crow bar, that the link may be threaded into the last one made.

the result of many months of experimental work. At first, the dies were built to suit wooden models of the links, and every decision was made by rule of thumb. But after making the process a success, and before going too far with the construction of the dies, the work was put on an engineering basis, and could now be put in a hand book. Recently the designs for the dies for 3½-inch chain were completed in the drafting room and sent into the shops; the dies were made and set up in their respective machines; and from the start the new chain was successful.

Briefly, the process of welding is as follows. A preheated link is threaded through the last link made,



BENDING BOLTS FOR MAKING LINKS

proved superior to the hand method. In this process, the bar iron is sheared up into bolts, each bolt long enough to make one link. Each bolt is then scarfed at both ends, each scarf requiring three operations. The first operation, done in an upsetting machine, puts in a right-angled bend and at the same time slightly upsets the metal.

The second operation, done in a steam drop hammer in the same heat, shapes the metal into a scarf. The third operation trims off the flash. When the two ends are thus treated, it is only necessary to bend the bolt into an approximate U-shape, whereupon the right angle bend of the scarf brings the two scarfs close together.

The scarfing and bending operations are very short, so a stock of each size in process is maintained for the welders. To avoid the necessity for the welder to start each weld with a cold link, a pre-heating furnace is provided, from which the welder gets his bent links for welding.

The welding process is performed in two heats. Each welding plant is composed of an 1,800-pound steam drop hammer, with a 250-pound single frame forging hammer on each side, thus employing two gangs. The two gangs divide the drop hammers between them, but each has its own 250-pound hammer, fire and crane.

The details of the cranes, hoists and dies, and their relative locations, are

and the scarfs pushed together by the dies in the 1,800-pound hammer. The dies of both hammers, and the center of the oil forge, being on the arc of the crane, the new link is swung over to the forge and lowered into the heating chamber. When at welding heat, it is taken out and over to the 250-pound hammer, where it is hammered between the horns of the dies. This operation does the major part of the welding.

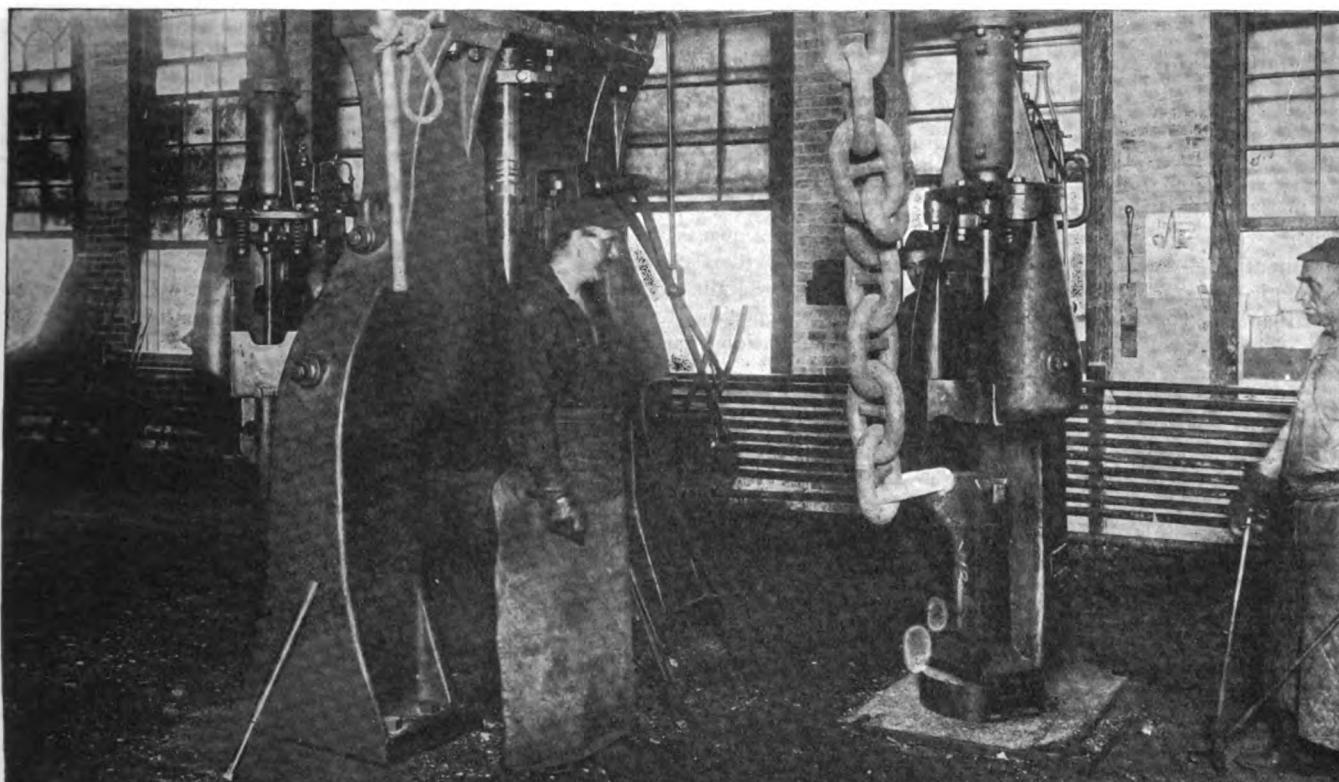
The link is swung back to the fire for a second welding heat, when it is taken to the forming dies, in the 1,800-pound hammer. There the tips of the scarfs are thoroughly welded, and the link exactly formed, all in a few blows. After trimming off the

flash and setting the stud in place, the link is closed down on the stud and the operation is complete.

When the hammer welding process was taken up actively for development, about one and one-half years ago, the process was essentially what it is today. The chain produced was to all appearances perfectly good, but it failed in tensile test, always falling short of the required ultimate break, and exhibiting a rather coarse granular structure in the fracture. The possibility of the oil fire being the cause was eliminated by the fact that coke fire welds behaved the same way. Alterations to the dies were made but although they were sensible alterations and improvements, the quality of the

6 feet wide and 30 feet long. It is of the overfired type, fitted with 16 burners, eight on each side. When heat treating chain, it is brought up as rapidly as practicable to about 900 degrees Cent., and held at that temperature until the charge is ready to come out. The regulation is comparatively close, the limit of variation being about 15 degrees at any one thermocouple or between couples in different parts of the furnace. There are eight couples in the furnace, four on each side; and the temperature of the iron is measured by a ninth couple, the hot junction of which is inserted in a piece of iron of the same diameter as the chain under treatment. This piece is laid on the

iron ductile enough to yield to shearing stresses, yet tough enough to be high in tensile strength. Stiffness must be avoided, as the close-grained, rigid structure desirable in a structural forging, does not answer in chain. The distribution of forces in the link is such that in the quarters there are maximums of shearing stress. These shearing stresses build up very rapidly, and unless the metal is ductile enough to yield to them, the link will shear off sharply, at a low total longitudinal pull, because, of course, iron is much weaker in shear than in tension. Stiffness promotes failure in shear; reasonable ductility combined with reasonable toughness promotes failure in tension. This was the hy-



LARGE STEAM DROP HAMMER AND SINGLE FRAME FORGING HAMMER

chain did not improve. Even the theory that practice makes perfect did not apply; it was thoroughly tested, too.

Heat treatment was thought of, but not very seriously at first. There was no equipment for exact methods of heat treatment, nor was there experience for guidance in attacking the problem. But finally, a test triplet of 3-inch chain was one day heated to what looked to be about 2,000 degrees Fahr. and cooled in air, just as a venture. It tested well above the specified requirements, and then, of course, the solution of the problem was a matter of detail.

The completed chain is heat treated in a car bottom fuel oil furnace about

car beneath the chain. The couples are of iron and constantan wire. The cold junctions of all couples are led by wires of the same metals to a box in the furnace booth, where the cold junction temperature is measured by thermometer, and allowed for. All temperature measurements are by potentiometer, the galvanometric method not being considered sufficiently accurate. The accuracy aimed at allows a maximum error of 10 degrees Cent., which at 1,000 degrees Cent. is about 1 per cent; but the accuracy actually obtained is somewhat better than that.

The action of the heat treatment is to reduce the brittleness, and coarseness of grain structure, making the

pothesis first evolved, and experiments warranted considering it a theory, especially as more exact methods of heat treatment became available and concordant test results could be obtained.

It is necessary to explain why the hammer-welded link must have heat treatment, while the hand-welded link does very well without it. The hammer-welded link has a long scarf, reaching well around to the quarters. Both in the scarfing and in the welding operations, the metal is thoroughly hammered; in the latter operation being hammered while cooling from welding temperature down through the critical range. As the scarf is long, this hammering reaches around into

the region where the shearing stresses are found. The hand welder, however, makes the scarf just as short as he can; the shorter it is, the less work for his helpers. The result is that less of the metal is severely worked, and that the working does not extend into the region of high shearing stresses. Therefore this region is not stiffened up enough to require subsequent heat treatment.

As might be expected, the hammer-welded link after it has been heat treated, is a better link than the hand-welded link; it is a better job mechan-

ically, and has a better and more uniform grain structure.

A natural concomitant of the application of power machinery to a process previously done by hand was the division of labor. No longer does the chainmaker scarf and bend and weld; one gang now scarfs, another bends, and a third does the welding. The last operation is very skilled work, and the workmen who do it are earning bigger wages than were the chainmakers before. The work of scarfing and bending does not require skilled labor, and those workmen who

do it earn less than the chainmakers did.

The total cost of the chain is less than before, but on the other hand, the workmen engaged in the process are earning more than they did before, because the lower priced work is being done by men who were helpers previously, but have been trained to these special jobs. On the whole, therefore, costs are lower, earnings are higher, production greater, and quality better than ever before. The process is an economic as well as an engineering development.

Educational Program of Lake Carriers

THE Lake Carriers' Association, through its educational committee, conducted an extensive educational program during the winter of 1915-1916 for the benefit of the men aboard ship. Instruction was given in navigation and in marine engineering, in addition to the classes in seamanship and general education in fundamentals—reading, writing and arithmetic—which were conducted in the assembly rooms last year. All these schools are free, the only requisite being a Welfare book showing previous service. The schools in navigation and marine engineering were projected solely for the benefit of the men and for the primary purpose of assisting them to obtain their first papers.

The school in marine engineering also has an advanced class for men preparing for chief engineers who may wish to be posted on the latter-day developments in marine engineering practice, such as turbines and internal combustion engines, but, as stated, the primary purpose of the schools is to assist the younger element in getting their first papers. All other interests are subordinated to this. Spacious quarters were engaged on the fourth floor of the Perry-Payne building, Cleveland, embracing rooms 413-417 inclusive, for the school in navigation and marine engineering.

Capt. T. B. Bolton, who has had about 13 years' experience in the Naval Reserve, is the instructor of the navigation school. The term, which began on Jan. 3, will extend to March 15, with two sessions daily. The list of subjects embraces the following: Pilot rules; courses and distances; lights, aids to navigation and shore markings; piloting, methods of checking position, etc.; compass and instrument work, laying out courses, variation, deviation, etc.; various situations. The marine engineering school

is in charge of George W. Bach, a practical marine engineer of long experience. The first course in this school consists of six lessons and involves the care and operation of marine machinery as well as elementary instruction in the construction of boilers, engines and auxiliaries. This includes the necessary arithmetic required as well as elementary drawing and other details incidental to the work of preparing the student to pass the examination for the first issue of license.

The second or advanced course consists of four lessons involving modern theories of efficient operation and practical design of marine machinery including advanced indicator practice, theories of boiler and engine design relating to the factors of safety, stresses, etc., also the fundamentals and design and operation of turbines and internal combustion engines. This course is intended for men preparing for chief engineers who wish to broaden their knowledge of the subject.

Harry Stone, chief engineer of the steamer JOSHUA W. RHODES, is also conducting a school in marine engineering at Marine City this winter. As Mr. Stone is a natural born teacher it is predicted that the percentage of pupils who will obtain papers will be very high.

These schools in navigation and marine engineering are, of course, entirely independent of the night schools which have been conducted in the assembly rooms in Buffalo, Cleveland, Detroit, Marine City, Milwaukee and Duluth during the past two winters. These night schools were conducted as usual and in the same quarters as last year.

Instruction in seamanship which was introduced last year in some of the assembly rooms and which made such a palpable hit was continued under competent instructors in the

seamen's rooms. In these modern days when steam does practically all the work and when the vessel is loaded and unloaded by mechanical appliances on dock there is little opportunity for the art of seamanship, as it was formerly practiced. Yet its traditions deserve to be handed down and it is gratifying to note that the younger element take kindly to it. Instruction in seamanship includes boxing the compass, rope splicing (both manila and wire) and all of the hitches in practical use aboard the vessels of the association.

Article Attracts Interest

The article on "How Ships Act on Backing Trials" in the January *Marine Review* has brought forth a number of appreciative comments. We are permitted to abstract the following from a letter from C. H. Peabody, professor of naval architecture at the Massachusetts Institute of Technology, Boston:

"The paper by Henry Penton in the current number of *The Marine Review* on 'How Ships Act on Backing Trials,' has just come to my attention and I wish to express my admiration of the work the author has done and the clear way you have presented it; in particular I admire the simple and effective way the author devised for finding the path of the ship. If Mr. Penton will permit, I propose making an abstract of this paper for my classes."

The California Shipbuilding Co., incorporated in Maine, has acquired the plant and equipment of the Craig Shipbuilding Co., Long Beach, Cal., where it will conduct a ship building, dry docking, machine, foundry and repair business, utilizing the facilities formerly operated by the Craig company.

What the Government is Doing

Rulings on Marine Matters

Improvements to Waterways

Hints to Navigators

Complete Text of New Shipping Bill

UNDER the guise of a plan for developing naval auxiliaries, the administration's shipping bill was introduced in congress a few days ago. The bill is substantially the same as the measure defeated at the last session of congress. The principal exception is found in the emphasis placed on the naval auxiliary feature. The events of the past year have served to bring the need for these auxiliaries prominently before the public and advocates of the new bill apparently hope to use this advertising to win support.

The bill is now in the hands of the merchant marine committee. Hearings will be begun shortly, it is said, and the administration forces hope to have the bill before congress for early consideration. One of the arguments against the bill last year, that is the failure to provide definitely for the withdrawal of the government from the shipping business, has been ignored in the revised draft.

No government official at Washington will venture to state just where the government will secure the ships provided for by the bill. With the country's ship yards flooded with demands for merchant tonnage from private investors, and deliveries, in some cases, postponed until the middle of next year, the question of actually securing the boats provided for in the bill, has apparently been disregarded.

Text of Revised Ship Bill

The full text of the bill, which was introduced by Chairman Alexander, of the merchant marine committee, follows:

Following is the full text of the bill introduced in the House by Chairman Alexander, of the Merchant Marine Committee, entitled "A bill to establish a United States Shipping Board for the purpose of encouraging, developing and creating a naval auxiliary and naval reserve and a merchant marine to meet the requirements of the commerce of the United States with its territories and possessions, and with foreign countries, and for other purposes":

Be it enacted by the Senate and House of Representatives of the

United States of America in Congress assembled, that a board is hereby created and established, to be known as the United States Shipping Board (hereinafter referred to as the board) with powers and duties hereinafter enumerated. The board shall be composed of the Secretary of the Navy and the Secretary of Commerce, as members ex officio, and three commissioners, to be appointed by the President, by and with the advice and consent of the Senate; one of such commissioners to be designated by the President as chairman of the board and one as vice chairman. The chairman of the board, subject to its supervision, shall be the active executive officer. The first commissioners appointed shall continue in office for terms of two, four and six years, respectively, from the date of their appointment, the term of each to be designated by the President, but their successors shall be appointed for terms of six years, except that any person chosen to fill a vacancy shall be appointed only for the unexpired term of the commissioner whom he shall succeed. No commissioner shall engage in any other business, vocation, or employment, and any commissioner may be removed by the President for inefficiency, neglect of duty, or malfeasance in office. A vacancy in the board shall not impair the right of the remaining members to exercise all of the powers of the board. The board shall have an official seal, which shall be judicially noticed.

Sec. 2. That each member of the board, except ex officio members, shall receive a salary of \$10,000 per annum. The board shall appoint a secretary, who shall receive a salary of \$5,000 per annum, and it shall have the authority to employ and fix the compensation of such attorneys, officers, naval architects, clerks and other employes as it may from time to time find necessary for the proper performance of its duties and as may from time to time be appropriated for by the Congress. The President may authorize the detail of officers of the military and naval services of the United States for such duties in connection with the board as may be deemed necessary.

With the exception of the secretary, a clerk to each commissioner, the attorneys, naval architects and such special experts and examiners as the board may from time to time find necessary to employ for the conduct of its work, all employes of the board shall be a part of the classified civil service and shall enter the service of the board under such rules and

regulations as may be prescribed by the board and the Civil Service Commission.

All the expenses of the board, including all necessary expenses for transportation, incurred by the members of the board or by its employes under its orders, in making any investigation, or upon official business in any other place than in the city of Washington, shall be allowed and paid on the presentation of itemized vouchers therefor approved by the board.

Until otherwise provided by law, the board may rent suitable offices for its use.

The Auditor for the State and other departments shall receive and examine all accounts of expenditure of the board.

\$50,000,000 for Ships

Sec. 3. That the United States, through the board and with the approval of the President, is authorized to construct in American ship yards and navy yards, as their capacity will permit, or elsewhere, or to purchase or charter vessels of a type, as far as the commercial requirements of the marine trade of the United States may permit, suitable for use as naval auxiliaries and army transports, or for other naval and military purposes, with a view to chartering, leasing, or selling such vessels to any corporation, firm, or individual, a citizen or citizens of the United States, desiring to use them in the transportation of the commerce of the United States with foreign countries, or with Alaska, the Panama Canal Zone, the Philippine Islands, the Hawaiian Islands, or the islands of Porto Rico, Guam, and Tutuila, and for this purpose the Secretary of the Treasury, upon the request of the board and the approval of the President, may from time to time issue and sell or use for such purchases, chartering, or construction any of the bonds of the United States now available in the Treasury of the United States under the Act of August fifth, nineteen hundred and nine, the Act of February fourth, nineteen hundred and ten, and the Act of March second, nineteen hundred and eleven, relating to the issue of bonds for the construction of the Panama Canal, to a total amount not to exceed \$50,000,000: Provided, That any Panama Canal bonds issued or used under the provisions of this section may be made payable at such time after issue not exceeding fifty years as the Secretary of the Treasury, in his discretion, may deem advisable and fix, instead

of fifty years after date of issue, as in said Act of August fifth, nineteen hundred and nine prescribed: Provided, further, That payments for such purchases, chartering, or construction from the proceeds of sales of bonds, or delivery of bonds in payment therefor, shall be made only as ordered and directed by the board.

Charter to Private Interests

Sec. 4. That the board is hereby authorized to charter, lease, or sell the vessels purchased, chartered, or constructed by the United States, as herein provided, to any corporation, firm, or individual, a citizen or citizens of the United States, desiring to use them in the transportation of the commerce of the United States with foreign countries, or with Alaska, the Panama Canal Zone, the Philippine Islands, the Hawaiian Islands, or the islands of Porto Rico, Guam, and Tutuila, upon such terms and conditions as may be prescribed by the board and approved by the President: Provided, That vessels constructed in American ship yards and navy yards, under the provisions of this act, may be chartered, leased, or sold to any such corporation, firm, or individual, a citizen or citizens of the United States, for the coastwise trade of the United States, particularly the trade between the Atlantic, Gulf and Pacific coasts: And provided further, That such corporation, firm or individual shall agree that any and all vessels purchased, leased, or chartered from the said board shall be operated under American registry or enrollment, unless otherwise authorized and approved by the board, and that no vessel purchased, leased, or chartered from the said board will be sold, leased, chartered, or rechartered to any corporation, firm, or individual without the consent and approval of the said board: And provided further, That such corporation, firm, or individual shall agree that its or his interest in any and all vessels purchased, leased, or chartered from the board may be taken at any time by the United States, absolutely or temporarily, and the vessels used as transports, naval auxiliaries, cruisers, or for any other naval or military purpose, upon the payment to the corporation, firm, or individual interested of the fair actual value of its or his interest therein, based upon normal conditions, if the vessels are taken absolutely, or the reasonable rental value, based upon normal conditions, if taken temporarily, such fair actual value or reasonable rental value, as the case may be, to be determined by the board and approved by the President.

When the vessels purchased or constructed by the board as herein provided, and owned by the United States, become in the opinion of the board unfit for the purpose for which purchased or constructed, the same shall be appraised and sold, either by sealed proposals for the purchase of the same or by public auction after advertisement of the sale for such time as in the judgment of the board the public interests require, the proceeds of such sales, after payment therefrom of the expenses thereof, to be covered into the Treasury of the United States.

Sec. 5. That the President of the United States is hereby authorized

to transfer to the board such naval auxiliaries belonging to the Naval Establishment of the United States as are suitable for commercial uses, and which are not required for use in the navy in time of peace, and vessels belonging to the War Department suitable for commercial uses and not required for military transports in time of peace, and to cause to be transferred to the board vessels now owned and operated by the Panama Railroad Company, and not required in the business of such company, and the board, subject to the approval of the President, is hereby authorized to charter, lease, or sell such vessels to any corporation, firm, or individual, a citizen or citizens of the United States, desiring to use them in the coastwise trade of the United States, particularly the trade between the Atlantic, Gulf and Pacific coasts, or in the transportation of the commerce of the United States with foreign countries, or with Alaska, the Panama Canal Zone, the Philippine Islands, the Hawaiian Islands, or the islands of Porto Rico, Guam, and Tutuila, upon such terms and conditions as the board, with the approval of the President of the United States, shall prescribe: Provided, that such corporation, firm, or individual shall agree that any and all vessels purchased, leased or chartered from the said board shall be operated under American registry or enrollment, unless otherwise authorized and approved by the board, and that no vessel purchased, leased or chartered from the said board will be sold, leased, chartered or rechartered to any corporation, firm or individual without the consent and approval of the said board: And provided further, That such corporation, firm or individual shall agree that its or his interest in any and all vessels purchased, leased or chartered from the said board may be taken at any time by the United States, absolutely or temporarily, and the vessels used as transports, naval auxiliaries, cruisers, or for any other naval or military purpose, upon the payment to the corporation, firm or individual interested of the fair actual value of its or his interest therein, based upon normal conditions, if the vessels are taken absolutely, or the reasonable rental value, based upon normal conditions, if taken temporarily, such fair actual value or reasonable rental value, as the case may be, to be determined by the board and approved by the President.

Considered as Merchant Vessels

Sec. 6. That all vessels purchased, chartered, or leased from the board, as herein provided, shall be registered or enrolled under the laws of the United States as vessels of the United States and entitled to the benefits and privileges appertaining to vessels of the United States, and shall, when and while employed solely as merchant vessels, be in all respects subject to all laws, regulations, and liabilities governing merchant vessels, whether the United States be interested therein as owner, in whole or in part, or shall have or hold any mortgage, lien, or other interest therein, and hereafter no vessel registered or enrolled under the laws of the United States shall be sold to any person, firm, or corporation

other than a citizen of the United States, or transferred to any foreign registry without the approval of said board, and in the event that any vessel is sold or transferred except as herein provided, such vessel shall thereafter be refused clearance from any and all American ports and the vendor or transferor of such vessel shall be deemed guilty of a misdemeanor and shall be subject to imprisonment for not less than one nor more than five years, or to the payment of a fine of not less than \$1,000 and not more than \$5,000 or both.

Sec. 7.—That the President of the United States, upon giving to the corporation, firm, or individual interested such reasonable notice in writing as in his judgment the circumstances will permit, may take possession, absolutely or temporarily, for use as transports, naval auxiliaries, cruisers, or for any other naval or military purpose, of any vessel or vessels purchased, leased or chartered from the board, and said corporation, firm or individual shall be entitled to a reasonable price or rental therefor, based upon normal conditions, to be determined by the board and approved by the President: Provided, That if in the judgment of the President an emergency exists requiring such action, he may take possession of any such vessel or vessels without notice.

Organize Private Company

Sec. 8.—That the board hereby created, if in its judgment such action is necessarily to carry out the purposes of this Act, may form under the laws of the United States, or of the District of Columbia, a corporation or corporations with capital stock in such amount as the board may prescribe, such capital stock, however, to be within the limits of the appropriations made by this Act, whose object shall be the purchase, construction, equipment, maintenance, and operation of merchant vessels in the commerce of the United States and with foreign countries and with Alaska, the Panama Canal Zone, the Philippine Islands, the Hawaiian Islands, or the islands of Porto Rico, Guam, and Tutuila, and the chartering or leasing of vessels for such purposes; and for and on behalf of the United States, may subscribe to and purchase not less than a majority of the capital stock of such corporation or corporations, and shall have the authority to vote the stock of the United States owned in such corporation or corporations, and also to do all other things in regard thereto as may be necessary to protect the interests of the United States and to carry out the purposes of this Act, and the board, with the approval of the President, may at any time sell the stock of such corporation or corporations owned by the United States.

Sec. 9.—That the board hereby created shall have the power and authority to regulate the operation of all corporations, firms, or individuals engaged as common carriers in the transportation of passengers and property by water between the ports of the United States, and not entirely within the limits of a single State, and between the United States and foreign countries, and between the United States and its territories and possessions, and between the territories and possessions of the United States, and to determine and prescribe just and reasonable rates or charges to be demanded or collected for the transportation of pas-

gers and property in such trade, and just, fair and reasonable classifications, regulations, or practices to be followed with regard thereto: Provided, however, that the board may prescribe preferential rates covering the transportation aforesaid, if, in its judgment, such rates are necessary in order effectually to carry out the purposes of this act. And when property may be and is transported by common carriers from a point within the United States to foreign countries or to or from the territories or possessions of the United States, the carriage being by a railroad or railroads or other means of transportation, within the United States, and a vessel or vessels operating under American registry or enrollment, the board is hereby authorized to determine and prescribe through routes between and over such rail and water lines, and just and reasonable joint rates or charges to be demanded and collected for the transportation of property over such routes, and to determine and prescribe just, fair and reasonable classifications, regulations or practices to be adopted and followed in regard to such traffic, including the issuance and form of through bills of lading and permits for shipments for specific sailings which shipments are hereby expressly authorized: Provided, however, That the board may prescribe preferential rates covering the transportation aforesaid, if, in its judgment, such rates are necessary in order effectually to carry out the purposes of this Act. And whenever the carriers between and over whose lines joint routes have been established and prescribed, as aforesaid, shall fail to agree among themselves upon the apportionment or division of the joint rate prescribed by the board, as aforesaid, the board may, after a hearing, prescribe the just and reasonable proportion of such joint rate to be received by each carrier party thereto, provided that in determining the just and reasonable proportion of such joint rate to be received by any railroad company or companies the board shall act in conjunction with the Interstate Commerce Commission with regard thereto and the prior publication of such rates as provided by the Interstate Commerce Act shall not be required.

The board shall also have power and authority to make diligent investigations into the navigation laws of the United States and into the organization, conduct, and management of the business of all corporations, firms, or individuals engaged as common carriers in the marine transportation aforesaid, and to gather and report to the President of the United States such information and data as will enable him to recommend to the Congress legislation for the regulation of such commerce and for the promotion and development of the American merchant marine.

In order to accomplish the purposes declared in the foregoing provisions of this section, the provisions of the Act to regulate commerce, approved February fourth, eighteen hundred and eighty-seven, and all Act amendatory thereof and supplementary thereto, are hereby extended to include common carriers engaged in the transportation of passengers and property by water between the ports of the United States, and not entirely within the limits of a single State, and between the United States and foreign countries, and between the United States and its Territories and possessions, and between the Territories and

possessions of the United States, so far as applicable, except that in respect to such common carriers the board hereby created shall be substituted in lieu of the Interstate Commerce Commission mentioned therein.

Sec. 10.—That on and after January first, nineteen hundred and seventeen, no corporation, firm, or individual shall engage in the business of transporting passengers or property by water between the ports of the United States and not entirely within the limits of a single State, or between the United States and foreign countries, or between the United States and its territories and possessions, or between the territories and possessions of the United States, without first obtaining a license so to do from the board hereby created, and the collector of customs or other officer of customs is hereby authorized and directed to refuse clearance to any vessel unless the corporation, firm, or individual owning or operating the same is a holder of such license. The said board is hereby authorized and directed to promulgate and establish from time to time such rules and regulations, to be observed by all corporations, firms, or individuals engaged in the business aforesaid, as may in its judgment be necessary to secure a full and complete compliance with the above provision and to carry out in the most effective manner the provisions of this Act, and is also authorized and directed to revoke licenses theretofore granted when satisfied that the rules and regulations promulgated as aforesaid are not being observed or the provisions of this Act are not being complied with: Provided, That the authority hereby granted shall not be construed to affect existing laws in regard to vessels or the authority conferred by such laws upon any officer or officers or department or division of the Government to promulgate and establish rules and regulations relating thereto.

Sec. 11.—That any vessel operated under this Act may be listed as a vessel of the United States Naval Auxiliary Reserve, and such of the officers and crews of such vessels as may volunteer for the purpose may be enrolled as members of such reserve in various ranks and ratings corresponding to those of the United States navy not above the rank of lieutenant commander, provided they are citizens of the United States, under such regulations as may be prescribed by the Secretary of the Navy with the approval of the board. All persons thus enrolled in the said reserve shall be entitled to receive retainer allowances from the United States while so enrolled, at rates to be fixed by the board, not to exceed an allowance of \$5 per month for enlisted men, \$10 per month for petty officers, \$12 per month for warrant officers and \$15 per month for officers.

Sec. 12.—The board shall, on or before the first day of December in each year, make a report, which shall be transmitted to the Congress, and copies of which shall be distributed as are the other reports transmitted to the Congress. This report shall contain a record of all transactions of the board and of all expenditures and receipts under this Act, and of the operations of any corporation or corporations in which the United States may have become a stockholder, and the names and compensation of all persons employed by said board.

Sec. 13.—That for the purpose of

carrying out the provisions of this act, there is hereby appropriated out of any money in the Treasury of the United States not otherwise appropriated, the sum of \$50,000,000, and the Secretary of the Treasury may issue and sell so many of the Panama Canal bonds authorized to be issued and sold by section three, and on the same terms, as may be necessary to secure the amount of \$50,000,000, and set apart and use the proceeds thereof for such purpose.

Sec. 14.—That all Acts, and parts of Acts in conflict with the provisions of this Act are hereby repealed.

Laws for Measuring Vessels

Regulations interpreting the laws that relate to the measurement of vessels, together with copies of the laws of the United States on that subject and of the Suez Canal regulations, have been published by the Bureau of Navigation, Department of Commerce, in a single book of 84 pages, for the guidance of those identified with maritime interests. There are 22 pages of instructions for the tonnage measurement of vessels, with subdivisions under the general topics of gross tonnage and net tonnage. The laws of the United States relative to the measurement of vessels include those applying to measurement, gross tonnage, deck houses, breaks, etc., hatchways, between decks, open vessels, water ballast, net tonnage, crew accommodations, deductions for other purposes, deductions for propelling power, register tonnage, appendix of measurement, vessels exempt from measurement and measurement of foreign vessels.

Measurement Rules

Brief reference is made to the Panama canal rules for measurement, with the statement that customs officers may obtain copies, as well as supplies of Panama canal tonnage certificates, from the chief office, the Panama canal, Washington, D. C. Questions of interpretation under the Panama canal measurement rules are to be submitted in writing directly to the governor of the Panama canal, Balboa Heights, Canal Zone. Decisions on such subjects are to be published and distributed to collectors of the customs. There are 43 pages relating to the Suez canal, including the measurement rules, memorandum on the application of the rules of 1904 relative to the measurement of superstructure, instructions to American custom's officers and regulations relating to the measurement of United States naval vessels for the Suez canal, the last mentioned for use in the preparation of tonnage certificates upon which tolls may be collected when ships of the United States Navy have occasion to pass through that canal.

990 Vessels Sunk in War Operations

Nearly One Thousand Merchant Ships Destroyed in 17 Months of Hostilities—Submarines Cause 55 Per Cent of Loss

THE European war up to Jan. 1, 1916, has caused the loss of 990 merchant vessels of all classes, with an approximate gross tonnage of 1,878,003 tons. This estimate is probably below the actual loss as the tonnage of some of the ships sunk could not be learned. The accompanying compilation was prepared by *The Journal of Commerce* and supplements the data published in *The Marine Review*, August, 1915. The table showing vessels lost includes those destroyed between June 30 and Dec. 31, 1915. The ships sunk previously were shown in the former article.

World's Tonnage and Ship Losses

The following table shows the number, tonnage and nationality of steam and sailing vessels destroyed in operations directly or indirectly resulting from war operations during the first 17 months, and shows also the number and tonnage of vessels owned in each country. The tonnage given in "tonnage owned by nations" is gross for the steam vessels and net for the sailing vessels:

Flag.	Steam and Sailing Vessels Owned According to Lloyd's Register Book, 1915-1916.		Gross Tons of Sail and Steam Vessels Destroyed in War (17 Months).	
	No.	Tons.	No.	Tons.
Un. Kingdom	9,285	19,541,364	602	1,192,551
British Colonies	2,068	1,732,700		
*United States	2,580	3,522,913	7	14,087
Austro-Hungary	433	1,018,210	6	13,240
Danish	835	854,966	29	33,293
Dutch	809	1,522,547	21	36,843
French	1,539	2,385,728	54	125,978
German	2,166	4,706,027	65	161,888
Italian	1,177	1,736,545	24	60,217
Japanese	1,155	1,826,029	3	16,415
Norwegian	2,174	2,529,188	77	103,023
Russian	1,256	1,054,762	31	34,193
Spanish	642	899,204		
Swedish	1,462	1,122,883	35	32,667

*Excluding vessels trading on the Great Lakes of North America.

†Japanese sailing vessels are not inserted in Lloyd's Register Year Book, and are therefore not included in these tables.

England's Losses 1,192,551 Gross Tons

England's merchant marine aggregated 21,274,064 gross tons on June 30, 1914, according to the last official figures given by Lloyd's. Without reference to the number or tonnage of enemy vessels held or captured by the respective belligerents, England's gross tonnage in the first 17 months of the war had been reduced by about 1,192,551 tons. A total of approximately 602 vessels flying the Union Jack has been destroyed by submarines, mines, cruisers or from other war operations. The

British tonnage losses were divided about as follows: 338 merchant steamers and 264 trawlers, fishing smacks, steam drifters and sailing vessels.

Germany's merchant tonnage at the last official reckoning aggregated 4,706,027 gross tons. Up to the close of 1915, or in 17 months of the war, close search of all available records shows that this gross tonnage had been reduced, through actual destruction of about 65 vessels of all classes, by approximately 161,888 tons. This comparatively small loss of tonnage through destruction, against the total losses of England, results largely from German and Austrian vessels rushing into shelter at all ports of the world when the war broke out.

The detailed tabulations of the merchant tonnage losses by the different nations indicate, in striking manner, the power of the submarine in destroying commerce. Considerably over 55 per cent of the vessels given in the lists has been destroyed by such instruments of warfare. The serious danger to shipping in war time from mines is also evident. Neutral tonnage of the Scandinavian countries, adjacent to Germany, being exposed to mine hazards to the greatest extent, have suffered extremely heavy losses from such weapons of war, although in the more recent instances of neutral ship losses, attacks by hostile submarines have also occurred.

Losses by Nations

How the various nations have suffered in the loss of tonnage as the result of the war, is shown in the following table, showing the number of vessels and their aggregate known gross tonnages:

Country	No. of Ships Lost	Gross Tons.
England, inc. 320 merchant steamers, and 264 trawlers, sailing vessels, etc.	602	1,192,551
Germany, vessels of all types	65	161,888
Norway, vessels of all types	77	103,023
France, vessels of all types	54	125,978
Denmark, vessels of all types	29	33,293
Sweden, vessels of all types	35	32,667
Holland, vessels of all types	21	36,843
Russia, vessels of all types.	31	34,193
Greece, Spain and Japan, all vessels	15	39,662
Italy, vessels of all types	24	60,217
Turkey, vessels of all types	18	18,150
Belgium, vessels of all types	6	12,211
Austria-Hungary, vessels of all types	6	13,240
United States, vessels of all types	7	14,087
Total	990	1,878,003

Fifty Large Steamers Lost

Among the large steamers that have been destroyed as a result of the war

are those which have been listed in the following table:

	Gross tons.
Lusitania (Br.)	30,396
Cap Trafalgar (Ger.)	18,710
Kaiser Wilhelm der Grosse (Ger.)	13,952
Oceanic (Br.)	17,274
Vandyck (Br.)	10,328
La Correntina (Br.)	8,250
Elsinore (Br.)	6,542
Hesperian (Br.)	9,599
Urbius (Br.)	6,651
Marquette (Br.)	7,057
Californian (Br.)	6,223
Lumina (Br.)	6,218
Commodore (Br.)	5,858
Floride (Fr.)	6,629
Guatemala (Fr.)	5,913
Yunnan (Fr.)	6,474
Navarra (Ger.)	5,974
City of Winchester (Br.)	6,601
Baden (Ger.)	7,676
Kaipara (Br.)	7,392
Cormorant (Br.)	7,595
Highland Brae (Br.)	7,634
Lovat (Br.)	6,102
San Wilfredo (Br.)	6,458
Troilus (Br.)	7,652
Princess Irene (Br.)	6,000
India (Br.)	7,946
Royal Edward (Br.)	11,117
Iberian (Br.)	5,223
Armenian (Br.)	8,823
Arabic (Br.)	15,801
Windsor (Br.)	6,055
Baron Erskine (Br.)	5,585
Admiral Hæmnelin (Fr.)	5,051
Ancona (Ital.)	8,210
Porto Said	5,167
Yasukini Maru (Jap.)	5,118
Yasaka Maru (Jap.)	8,297
Maryland (Dan.)	5,136
Konigin Emma (Dutch)	9,181
Eendwyk (Dutch)	6,180
Rechid Pasha (Turk.)	8,000
Orteric (Br.)	6,535
Persia (Br.)	7,974
Glengyle (Br.)	9,395
Dante Alighieri (Ital.)	9,754
Ville de la Crotat (Fr.)	6,378
Dagla (Fr.)	5,600

In making up the lists, no account was taken of the 33 German steamers which were destroyed when the Belgians and British evacuated Antwerp. These steamers aggregated in gross tonnage 109,280 tons, and nearly all of them had valuable cargoes. Taking the lists given herewith as a whole, however, it is interesting to note that an official German statement issued by wireless from Berlin under date of Dec. 20, 1915, states that from the beginning of the war up to the close of November, 1915, 734 enemy ships with a gross tonnage of 1,447,628 tons had been destroyed by the Teutonic allies, and of the ships destroyed 624, with 1,231,944 gross tons, were British. This represents a loss of slightly under 6 per cent of the total British tonnage.

In many instances the identity of a vessel has not been stated, the official announcement merely saying that "a steamer" of a specifically stated gross tonnage has been lost, and in only few instances can the gross tonnage of the trawlers be shown officially, although these for the most part average in gross tons between 50 and 100 tons.

Merchant Ships Sunk in War, June 30-Dec. 31, 1915

British Merchant Tonnage Destroyed

Name and cause—	Gross tons	Name and cause—	Gross tons	Name and cause—	Gross tons
Oakwood, submarine	4,279	Gladiator, sunk	3,359	Woolwich, sunk	2,936
Rosalie, submarine	4,243	New York City, sunk	2,970	Glenmoor, sunk	3,075
India, auxiliary cruiser, submarine	7,940	Restormel, sunk	2,118	Buresk, sunk	3,673
Jacona, submarine	2,969	Samara, sunk	3,172	Californian, sunk	6,223
Osprey, submarine	310	Diomed, sunk	4,672	Clan Macalister, sunk	4,835
Summerfield, submarine	687	Silvia, sunk	5,268	Moorina, sunk	4,994
Cairo, submarine	1,671	A steamer, sunk	4,029	Caria, sunk	3,032
Princess Caroline, submarine	888	A steamer, sunk	3,576	Moorside, sunk	311
Royal Edward, transport, submarine	11,117	A steamer, sunk	2,196	Rhineland, sunk	1,591
Costello, submarine	1,591	A steamer, sunk	3,034	Den of Crombie, sunk	4,949
Portia, submarine	494	A steamer, sunk	557	Sir Richard Awdry, sunk	2,234
Glenravel, submarine	1,092	A steamer, sunk	4,572	A steamer, sunk	1,400
Midland Queen, submarine	1,993	Savona, sunk	1,180	Irene (yacht), sunk	543
Mangara, submarine	1,821	Churston, sunk	2,470	Anglia (hospital ship), mine	1,862
Iberian, submarine	5,233	Whitefield, sunk	2,422	Lusitania, sunk	1,834
Benvorlich, submarine	3,381	Cymbeline, sunk	4,505	Trenglos, sunk	3,886
Clintonia, submarine	3,830	Hesperian, submarine	9,599	Lumina, torpedoed	6,218
Fulgens, submarine	2,512	Mimosa, sunk	3,466	Hallamshire, sunk	4,420
Ranza, submarine	2,320	Dictator, sunk	4,116	Merganser, sunk	1,905
Firth, submarine	406	Douro, sunk	1,603	A steamer, sunk	3,583
Grangewood, submarine	3,422	Mora, sunk	3,047	A steamer, sunk	3,409
Guido, submarine	2,090	Ashmore, sunk	2,519	Tunis, sunk	3,655
Ellesmere, submarine	1,170	Corunbia, sunk	1,736	Dotterel, sunk	1,596
Welburg, submarine	3,591	San Zefirino, beached, refloated	6,430	A steamer, sunk	2,154
Tunisiana, submarine	4,220	Horden, sunk	1,434	Colenso, sunk	3,861
Huntry (ex <i>Orphelia</i>), sunk	1,153	Linkmoor, sunk	4,306	Kingsway, sunk	3,649
Belford, sunk	488	Groningen, sunk	988	Malinche, sunk	1,868
Armenian, submarine	8,825	A steamer, sunk	4,792	Orange Prince, sunk	3,583
Lomas, submarine	3,048	Chancellor, sunk	4,586	Langton Hall, sunk	4,437
Caucasian, submarine	4,636	Urbino, sunk	6,651	Clan Macleod, sunk	4,796
Inglemoor, submarine	4,331	Hesione, sunk	3,363	Middleton, sunk	2,506
Craigard, submarine	3,286	Novocastrian	1,151	Commodore, sunk	5,858
Gadsby, submarine	3,497	A steamer	4,114	Umeta, sunk	5,312
Larchmore, submarine	4,355	A steamer	2,124	Busurio, sunk	2,720
Renfrew, submarine	3,488	Haydn, sunk	3,923	Pinegrove, sunk	2,847
Richmond, submarine	3,214	Sailor Prince, sunk	3,144	Levenpool, beached	4,844
Indran, submarine	3,640	Arabian, sunk	2,744	Alexandra (transp.), submarine	4,000
Lucena, submarine	243	Newcastle, sunk	3,403	Helmsmuir, sunk	4,111
Strathnairn, submarine	4,336	Schawby, sunk	3,658	Burrifield (transp.), submarine	4,037
Trafford, submarine	215	Silverash, sunk	3,753	Ignis, sunk	2,042
Ailsa, submarine	876	Thorwood, sunk	3,184	Enosis, submarine	3,409
Dulcie, submarine	2,033	Halizones, reported sunk	5,093	Tringa, sunk	2,154
Cansbrook, submarine	2,352	A steamer, submarine	4,037	G. H. Henry (trans.), submarine	4,219
Bonny, sunk	2,702	Salerno, sunk	2,071	Veria, sunk	3,229
Maggie, sunk	269	Alepo, beached	3,870	Heridia (transp.), submarine	4,944
Thornfield, sunk	488	Auk, sunk	1,055	Oteric, sunk	6,535
Arabic, submarine	15,801	City of Berlin, sunk	999	Craigston (transp.), submarine	2,617
Grodnos, sunk	1,955	Iris, sunk	942	Transylvania, submarine	14,000
Serbino, sunk	2,205	Marquette (transport), submarine	7,057	Van Stirum, sunk	3,284
Carterswell, sunk	4,308	Hythia (aux. sweeper), collision	509	Persia, submarine	7,974
Coyer, sunk	3,060	Toward, sunk	1,218	Glengyle, submarine	9,395
Windsor, sunk	6,055	Friargate, sunk	264	St. Oswald, submarine	3,810
William Dawson, blown up	284	Alastair, sunk	366	Abelia, sunk	3,650
Baron Erskine, sunk	5,585	Ramaban (transport), submarine	3,477	Total (338 vessels)	1,150,826
Ben Vrackie, sunk	3,908	Woodheld, sunk	3,584		
Bittern, sunk	1,797	Tara, submarine	1,862		
Dunsley, sunk	4,930				

British Trawlers, Smacks and Sailing Vessels Destroyed

Name and cause—	Gross tons	Name and cause—	Gross tons	Name and cause—	Gross tons
George Crabbe (trawler), submarine	Heliotrope (smack), submarine .....	...	Prosper (smack), submarine .....	...
Illustrious (trawler), submarine	Hesperus (smack), submarine .....	...	King Athelstan, submarine	159
Palm, submarine	Ivan (smack), submarine .....	...	Perseus, mine	155
Trevear, submarine	Ocean Queen, submarine .....	...	Roslin, submarine	128
Utopia, submarine	Ben Ardena, submarine	197	Strathmore, submarine	163
Welcome, submarine	Westminster, submarine	252	Celtic, submarine	264
Young Admiral, submarine	Emblem, submarine	157	Cydonia, submarine	259
Esperance, submarine	Icena, submarine .....	...	Gadwell, submarine	192
George Bonow, submarine	Salacia, submarine .....	...	Cassio, submarine	172
Oceans' Gift, submarine	Westward Ho (smack), submarine .....	...	Hermione, submarine	210
Amethyst (smack), submarine	Achieve, submarine .....	...	Honovia, submarine	179
Humphrey (smack), submarine	Athena, submarine .....	...	Sulton, submarine	332
White City (smack), submarine	Corlander, submarine .....	...	Purple Heather (smack), submarine .....	...
Thrush, submarine	264	Fitzgerald, submarine .....	...	Speedwell (smack), submarine .....	...
Gloria, submarine	264	Quest, submarine .....	...	Woodbine (smack), submarine .....	...
Bona Fide (smack), submarine	Strive, submarine .....	...	Lebanon (st. drifter), submarine	111
E. M. W. (smack), submarine	Young Percy, submarine .....	...	Primrose (st. drifter), submarine .....	...
J. W. F. T. (smack), submarine	Alert (smack), submarine .....	...	Josephine (st. drifter), submarine .....	...
Sunflower (smack), submarine	Tors, submarine	158	Elizabeth (st. drifter), submarine .....	...
Grimbarian, submarine	146	Commander (st. drifter), submarine	149	Research (st. drifter), submarine .....	...
Honoria, submarine	179	Piscatorial (st. drifter), submarine .....	...	Four (st. drifter), submarine .....	...
Christmas Rose, submarine	Uffa (st. drifter), submarine .....	...	J. M. & S. (st. drifter), submarine .....	...
C. E. S. (smack), submarine	Star of Peace, submarine	180	Ugiebrae (st. drifter), submarine .....	...
Challenger (smack), submarine	Activity (smack), submarine .....	...	Monarda (st. drifter), submarine .....	...
Fisherman (smack), submarine	Henry Charles (smack), submarine .....	...	Star of Bethlehem (st. drifter), submarine .....	...

(Continued on page 114)

Merchant Ships Sunk in War, June 30-Dec. 31, 1915

(Continued from page 113)

British Trawlers, Smacks and Sailing Vessels Destroyed

Name and cause—	Gross tons	Name and cause—	Gross tons	Name and cause—	Gross tons
Vine (st. drifter), submarine.....	110	Truro, submarine.....	165	Anglia, sunk	107
Campania, submarine	167	Edith (sailing vessel), submarine.....	...	Cineraria, mine	154
Cheshire, submarine	148	Dumfriesshire (sailing vessel), submarine	2,483	Constance (sailing vessel), sunk..	57
Syrian, submarine	175	Premier, submarine	169	Emmanuel (sailing vessel), sunk..	44
Hamton, submarine	150	Explore, submarine	156	Victorious (sailing vessel), sunk..	43
Merlen (smack), submarine.....	...	Japonica, submarine	145	Boy Ernie (smack), sunk.....	47
L. C. Tower (sailing vessel), submarine .....	...	Petrel, submarine	187	Nimrod, sunk .....	...
St. George, submarine.....	215	George Baker, sunk.....	91	Emblem, sunk	50
Sunbeam (sailing vessel), sunk.....	121	Martha Edmonds (sailing vessel), sunk	153	King William, sunk.....	163
Quiet Waters (st. drifter), submarine .....	...	Commander Boyle, sunk.....	...		
Viceroy, submarine	150	Roy Bert (cutter), sunk.....	57		
				264 vessels. Total known tons, gross	41,725

German Tonnage Destroyed

Name and cause—	Gross tons	Name and cause—	Gross tons	Name and cause—	Gross tons
Senator Von Berenberg (trawler), submarine	200	Direktor Reppenhagen, submarine	1,683	Rendsburg, submarine	4,639
Friedricharp, submarine	1,642	Nicomedie, submarine	4,391	Gertrude, submarine	1,038
Albatross, submarine	1,026	Walter Leonhardt, submarine	1,261	Pyrgos, submarine	3,588
Tenedos, submarine	3,564	Babylon, submarine	2,489	Emgard (?), submarine .....	...
Fischhandel (trawler), British cruiser .....	...	Pernambuco, submarine	4,788	John Wulf (?), submarine .....	...
Breslau (trawler), mine.....	...	Soderhamn, submarine (taken into port)	1,499	Gedania, submarine	1,477
Svionia, submarine	2,797	Dalalven, submarine	1,046	Suomi, submarine	1,016
Lulea, submarine	2,239	Johannes Russ, submarine	1,751	Claus Horn, submarine	2,690
Germania, submarine (refloated)	1,993	Electra, submarine	853	Cordelia, submarine	1,046
Grutune, submarine	3,039	Hernosand, submarine	1,182	Leros, submarine	2,679
		Plauen, submarine	4,210		
				65 vessels. Total gross tons...	161,888

French Tonnage Destroyed

Name and cause—	Gross tons	Name and cause—	Gross tons	Name and cause—	Gross tons
Francois (sailing vessel), submarine	1,945	Alose (trawler), mine	214	Djurjura, reported sunk in collision	1,852
Nieuport (transport), mine .....	...	Yunnan, submarine	6,474	Jesus Marie (trawler), blown up .....	...
Carthage, submarine	5,601	Amiral Hamelin, submarine	5,051	Antonia (troop ship), submarine	2,387
Hirondelle (sailing vessel), submarine	136	A steamer, sunk	2,387	Villa de la Ciotat, submarine	6,378
Bordeaux, sunk	4,530	Le Calvados, submarine	1,658	Dagla (transport), submarine	5,600
Guatemala, sunk	5,913	Dahra, submarine	2,127	Ravitailleur (transport), submarine	2,800
L'Aude, sunk	2,232	Sidi Ferruch, submarine	2,797	Isere, submarine	3,500
Villa de Mostaganem, sunk	2,648	Yser (ex Dacia), submarine	3,544		
St. Pierre (trawler), sunk .....	...	France, submarine	4,025		
Provincia, submarine	3,523	Algerian, sunk	1,703		
St. Marguerite, submarine	2,780	Omara, sunk	435		
		Danae, submarine	1,505		
				54 vessels. Total gross tons...	125,978

Russian Tonnage Destroyed

Name and cause—	Gross tons	Name and Cause—	Gross tons	Name and Cause—	Gross tons
Shura, submarine	1,113	Marion Lightbody (sailing vessel), submarine	2,063	Ilu (sailing vessel), hydroplane	106
Rubonia, submarine	3,644	Leo, submarine	2,224	Katza, submarine	500
Lennok, submarine	1,165	Leo (sailing vessel) sunk	257	Apscheron, submarine	1,000
Balva, submarine	1,142	Rhea, sunk	1,145		
General Radetzky, submarine	2,118				
				31 vessels. Total gross tons...	34,193

Italian Tonnage Destroyed

Name and cause—	Gross tons	Name and cause—	Gross tons	Name and cause—	Gross tons
Sardinene, submarine	1,861	Ancona, submarine	8,210	Gallinara (sailing vessel), sunk .....	...
A steamer, sunk	3,897	Elisa Francesca (sailing vessel), submarine	178	Pietro Lofaro (sailing vessel), sunk	465
Grazia, submarine	1,373	Bosnia, sunk	2,561	Dante Alighieri, sunk	9,754
A steamer, sunk	1,489	Tirenze, submarine	3,960	Girence, sunk	3,236
A steamer, sunk	3,109	Bormida, submarine	2,259	Dechino, submarine	2,450
Guiseppi, mine	150	Porto Said, submarine	5,167		
A steamer, sunk	3,236	Girence, submarine .....	...	
Scilla, submarine	1,220	Dinuf, sunk .....	...	
Ionig, submarine	1,816				
				24 vessels. Total gross tons...	60,217

Belgian Tonnage Destroyed

Name and cause—	Gross tons	Name and Cause—	Gross tons	Name and Cause—	Gross tons
Koophandel, submarine	1,736	Viga (transport), submarine	386	Hanefie, sunk	506
Princess Marie Jose, submarine	1,954	Bisga, submarine .....	...	Plevne, sunk	1,154
Prince Albert, mine	1,820	A steamer, submarine	1,500		
Bodognat, submarine	1,441	A sailing ship, submarine	400	18 vessels. Total gross tons...	18,150
Daghestan, sunk	2,817	A steamer, submarine	2,500		
A steamer, sunk	2,443	Chirketiwiwie, submarine .....	...	
		Rechid Pasha (transport), submarine	8,000		
6 vessels. Total gross tons.....	12,211				

(Concluded on page 115)

18 vessels. Total gross tons...

Austrian Tonnage Destroyed

Name and cause— Gross tons

Carmen (transport), submarine... 4,424

Bittinia, sunk 3,125

6 vessels. Total gross tons.... 13,240

Merchant Ships Sunk in War, June 30-Dec. 31, 1915

(Concluded from page 114)

Swedish Tonnage Destroyed

Name and cause—	Gross tons
Sverige, beached	1,602
Maj, submarine	913
Emma, submarine	665
Madonna, submarine	401
Fortuna (sailing vessel), submarine	170
Capella (sailing vessel), submarine	377
Daisy (sailing vessel), submarine	386
Vesta, submarine	538
Verdiana, submarine	950
Sven Renstrom, sunk.....	413
Rumina, mine	1,418
Sabrina (sailing vessel), submarine	298
Norrvik, mine	1,633
35 vessels. Total gross tons...	32,667

Losses of Greece, Spain and Japan

Name and cause—	Gross tons
Isidoro (Spanish), sunk.....	2,044
Pena Castille (Spanish), sunk.....	1,718
Dimitrios (Greek), sunk.....	2,508
Athamas (Greek), beached.....	3,867
Assimacos (Greek), beached.....	3,500
Yasukini Maru (Japanese), sunk.....	5,118
Yasaka Maru (Japanese), submarine	8,297
Zarifos (Greek), sunk.....	2,904
L. G. Goulandris (Greek), sunk..	2,123
Kenkoku Maru (Japanese), submarine	2,600
15 vessels. Total gross tons...	39,662

Norwegian Tonnage Destroyed

Name and cause—	Gross tons
Morna (sailing vessel), submarine	1,421
Aura, submarine	396
Albis, submarine	1,381
Norman (sailing vessel), submarine	995
Vanadis (sailing vessel), submarine	445
77 vessels. Total gross tons...	103,023

Name and cause—	Gross tons
Geiranger, submarine	1,081
G. P. Harbitz (sailing vessel), submarine	633
Sognedalen (sailing vessel), submarine	596
Trondhjemfjord, submarine	4,248
Nordleyser (sailing vessel), submarine	377
Fimreite, submarine	3,819
Ryn, submarine	2,013
Noordas, submarine	1,110
Thistlebank (sailing vessel), submarine	2,241
Fiery Cross (sailing vessel), submarine	1,344
Peik, submarine	1,168
Truma, submarine	1,557
Granit, submarine	662
Svemjari, sunk	1,135
Mineral, sunk	649
Romulus, sunk	819
Magda, sunk	1,063
Bras, sunk	1,851
Sverresborg, sunk	1,144
Glimt (sailing vessel), sunk	884
Storesand (sailing vessel), sunk	1,525
Praesto (sailing vessel), burnt	195
Welsbeck (sailing vessel), burnt .....	...
Norte (sailing vessel), sunk .....	...
Actic (sailing vessel).....	...
Flora (sailing vessel).....	167
Salerno, sunk	2,431
Selma, sunk	1,654
Eidsiva, sunk	1,092
Wacousta, sunk	3,521
Ulriken, sunk	2,379
San Miguel, mine	1,659
Klav, sunk	518
Sutton (sailing vessel), sunk	354
Nereus, sunk	782
Ingstad, sunk	780
Nico, sunk	712
77 vessels. Total gross tons...	103,023

American Tonnage Destroyed

Name and cause—	Gross tons
Vincent (sailing vessel), mine	1,776
Communipaw (ex Deutschland), sunk	3,710

7 vessels. Total gross tons.... 14,087

Dutch Tonnage Destroyed

Name and cause—	Gross tons
Ceres, submarine	1,749
Breskens (smack), mine .....	...
S. C. H. 316 (fishing vessel), mine	9,181
Konigin Emma, mine	6,180
Eemdijk, sunk	1,601
Texelstroom, mine .....	...
Johanna (lugger), mine .....	...
S. C. H. 450 (lugger), mine .....	...

21 vessels. Total gross tons.... 36,843

Danish Tonnage Destroyed

Name and cause—	Gross tons
Elna (sailing vessel), submarine	159
Jason (sailing vessel), submarine .....	...
Hans Emil (sailing vessel), submarine .....	...
Lena (sailing vessel), submarine .....	...
Neptune (sailing vessel), submarine .....	...
Maria (sailing vessel), submarine .....	...
Nugill, submarine	2,141
Ellen (sailing vessel), submarine	148
Frode, sunk	1,875
Thorvaldsen, sunk	1,220
Veset, mine .....	...
Minsk, beached	1,289

29 vessels. Total gross tons.... 33,293

TOTAL NUMBER SHIPS DESTROYED	990
TOTAL GROSS TONNAGE LOST	1,878,003

Contracts for Fuel Oil

The International Mercantile Marine Co., through its receiver, P. A. S. Franklin, has contracted to take about 400,000 barrels of oil fuel annually from the Mexican Petroleum Co. for the ships KROONLAND and FINLAND, which will return to the New York-California service of the Panama-Pacific line as soon as the Panama canal is reopened to navigation. Arrangements had been made to convert FINLAND and KROONLAND into oil burners at the Erie Basin shipyards, New York, where the work can be done in 20 days, but owing to the slides in the canal, conversion has been delayed until the waterway is cleared.

By substituting fuel oil for coal 48 firemen will be dropped from each of the Panama-Pacific liners and one day less will be required to make the trip from New York to San Francisco, it is claimed. Each ship will be able to carry about 1,500 tons additional cargo by reason of the smaller space required for fuel oil as compared with coal. Fuel oil for these ships will be delivered at New York and Cristobal and also at San Francisco and Los Angeles. It is

expected that two additional steamers of the line also will be converted into oil burners as soon as the first two are running on regular schedule.

Purchases Plant

The Union Iron Works, San Francisco, has purchased the plant of the United Engineering Works at Alameda, Cal., and it is expected that \$500,000 will be spent in improvements. J. Robert Christy, for several years manager of the Alameda plant, will continue in the same capacity with the new organization.

American Trade Profitable

Particular emphasis is laid on the prospects for development of American trade, in recent advices from Japan on shipping conditions in that country. The report of the Nippon Yusen Kaisha for the last half year was by far the most satisfactory in its history. The cause, of course, lies in the shortage of tonnage and the high freight rates prevailing, but it is pointed out that "on the American route, prosperity has been extraordinary." Another report states that

the "boom in shipping is enhanced, and new enterprises are being started, on the American route in particular." The Osaka Shosen Kaisha has placed additional vessels on the Tacoma-Seattle run.

Sells Steamers

Two steamers of the American-Hawaiian Steamship Co.'s fleet, NEBRASKAN and NEVADAN, are reported to have been sold, presumably to British buyers. As a result of the sale, it is said, the three new liners being completed for the company will be placed in the New York-San Francisco-Tacoma service as soon as the Panama canal is reopened. The steamers said to have been sold have recently been operating between Atlantic ports and Europe carrying war cargoes under special charters. The purchase price is estimated to have been more than \$1,000,000 each. Prior to the closing of the Panama canal by landslides, the vessels were used in the New York-San Francisco-Tacoma service and before that operated in the trade from Tacoma to the Hawaiian islands, Salina Cruz and San Francisco.

In the Traffic Manager's Office

A Review of the Charter Market on Coasts and Lakes—Pointers
for the Men Who Get the Business

Seeks to Buy Railroad-Owned Boats

KEEN interest was aroused during the past month, in the efforts of W. J. Connors, Buffalo, and his associates to purchase 35 passenger and freight vessels from the various railroad-owned lake steamship companies. The negotiations up until this time have not been successful. Serious differences are said to exist between the prices offered by Mr. Connors and those asked by the railroads. In addition at least one railroad, the Lehigh Valley, will continue the fight the railroads have made before the interstate commerce commission for permission to continue their operation of the lake vessels.

Some competition also has been experienced by the new syndicate from interests desirous of securing the vessels for ocean service. Charles W. Morse recently purchased four vessels of this class for service in the European and Latin-American trade.

An analysis of the decision of the interstate commerce commission, ordering the railroads to divorce their lake vessels interests, was published in *The Marine Review*, July, 1915. The decision was based on the provisions of the Panama canal act. The railroads appealed but the commission has again ruled adversely. The lines affected by the decision are the New York Central, Lehigh Valley, Erie, Pennsylvania, Rutland, and the Mutual Transit Co., owned jointly by the Erie, Lehigh Valley, New York Central and Delaware, Lackawanna & Western. The Lehigh Valley bases its hope for a moderation of the ruling on the fact that its line does not extend beyond Buffalo, the base of its lake line.

Some of the Ships Sold

The New York Central railroad has interests in two ship lines on the Great Lakes. One was operated by the Rutland Railroad Lake Line, a subsidiary, and the other by the Western Transit Co.

All of the six steamers of the Rutland Railroad Lake Line have been sold. Mr. Connors is understood to have bid unsuccessfully on several of these vessels. Two of the boats went to the

New York Coal & Coke Co., two to the Alaska Steamship Co., and the other two to the Pacific-Alaska Steamship Co. The price of the six boats was approximately \$600,000.

The Western Transit Co. has ten steamers. One of these, *MOHAWK*, has been sold to the Crosby Transportation Co., Milwaukee. She was built in 1893, is of 2,357 tons gross, 1,616 tons net, 292 feet long, 41.7 feet beam and 23 feet depth. She will continue to operate in the Great Lakes.

Sells Anchor Boats

The Pennsylvania Railroad operates the Anchor Line, also known as the Erie & Western Transportation Co. This line owns three passenger steamers *TIONESTA*, *JUNIATA*, and *OCTORARA*, and a large number of freighters. Four of the Anchor Line freight steamers are said to have been sold.

The Erie originally had eight steamers and has sold four, three of them having been acquired by the Morse syndicate.

Following is a list of the lake steamers, 35 of which are said to be included in the negotiations for purchase by the Connors syndicate, with the purpose of forming an independent freight-carrying shipping combination on the Great Lakes:

Western Transit Co. (subsidiary of the New York Central Railroad Co.) steamers—*BOSTON*, 4,184 tons gross, 3,283 tons net, built in 1913; *BUFFALO*, 3,951 tons gross, 3,272 tons net, built in 1899; *CHICAGO*, 3,195 tons gross, 2,546 tons net, built in 1901; *DULUTH*, 4,823 tons gross, 3,785 tons net, built in 1903; *MILWAUKEE*, 3,327 tons gross, 2,424 tons net, built in 1902; *ROCHESTER*, 4,571 tons gross, 3,855 tons net, built in 1907; *SUPERIOR*, 4,544 tons gross, 3,845 tons net, built in 1905; *TROY*, 3,655 tons gross, 2,966 tons net, built in 1898; *UTICA*, 3,533 tons gross, 2,658 tons net, built in 1904.

Erie & Western Transportation Co., Anchor Line (subsidiary of the Pennsylvania Railroad Co.) steamers—*CONE-MAUGH*, 3,898 tons gross, 2,967 tons net, built in 1909; *DELAWARE*, 3,901 tons gross, 3,250 tons net, built in 1905; *JUNIATA*, 4,333 tons gross, 2,619 tons

net, built in 1905; *MUNCY*, 3,863 tons gross, 2,946 tons net, built in 1902; *TIONESTA*, 4,329 tons gross, 2,652 tons net, built in 1903; *WISSAHICKON*, 4,062 tons gross, 3,104 tons net, built in 1907; *ALLEGHENY*, 3,898 tons gross, 2,967 tons net, built in 1910; *OCTORARA*, 4,329 tons gross, 2,652 tons net, built in 1910; *CODORUS*, 2,165 tons gross, 1,802 tons net, built in 1892; *MAHONING*, 2,189 tons gross, 1,744 tons net, built in 1892; *SCHUYLKILL*, 2,205 tons gross, 1,819 tons net, built in 1892; *SUSQUEHANNA*, 2,781 tons gross, 2,347 tons net, built in 1886. *JUNIATA*, *TIONESTA* and *OCTORARA* are combined passenger and freight steamers.

Mutual Transit Co. (subsidiary under joint ownership and control of the Erie, Great Northern, Pennsylvania and one other railroad company) : the steamers *NORTH STAR*, 3,849 tons gross, 2,928 tons net, built in 1909; *NORTHERN KING*, 2,476 tons gross, 1,885 tons net, built in 1888; *NORTHERN QUEEN*, 2,476 tons gross, 1,885 tons net, built in 1889; *NORTH WIND*, 2,476 tons gross, 1,185 tons net, built in 1888; *NORTHERN WAVE*, 2,476 tons gross, 1,885 tons net, built in 1889; *NORTH LAKE*, 3,861 tons gross, 2,941 tons net, built in 1909; *NORTH SEA*, 3,921 tons gross, 3,045 tons net, built in 1909.

Erie Railroad Lake Line: the steamers *F. D. UNDERWOOD*, 3,314 tons gross, 2,499 tons net, built in 1896; *D. W. COOKE*, 3,398 tons gross, 2,067 tons net, built in 1897; *TIOGA*, 2,320 tons gross, 1,684 tons net, built in 1885; *G. A. RICHARDSON*, 2,337 tons gross, 1,790 tons net, built in 1893.

Vessels of Lehigh Line

Lehigh Valley Transportation Co. (subsidiary of the Lehigh Valley Railroad Co.) : the steamers *BETHLEHEM*, 2,633 tons gross, 1,902 tons net, built in 1888; *MAUCH CHUNK*, 4,499 tons gross, 3,609 tons net, built in 1901; *SARANAC*, 2,669 tons gross, 1,939 tons net, built in 1890; *SENECA*, 2,669 tons gross, 1,939 tons net, built in 1889; *TUSCARORA*, 2,386 tons gross, 1,769 tons net; *WILKESBARRE*, 3,311 tons net, built in 1901.

Port Huron & Duluth Steamship Co.: the steamers *LAKELAND*, 2,425 tons gross,

1,813 tons net, built in 1887; LAKWOOD, 1,917 tons gross, 1,677 tons net, built in 1884; LAKEPORT, 1,829 tons gross, 1,669 tons net, built in 1880.

Canada Atlantic Transit Co.: the steamers ARTHUR ORR, 2,745 tons gross, 2,117 tons net, built in 1893; GEORGE N. ORR, 2,872 tons gross, 2,280 tons net, built in 1896; KEARSARGE, 3,092 tons gross, 2,721 tons net, built in 1894.

Morse Buys Ships

Charles W. Morse, as the head of a New York syndicate, has purchased four lake steamers from the Mutual Transit Co., which is owned jointly by the four railroad lines, for \$600,000.

The vessels which have changed hands are WILLIAM CASTLE RHODES, 2,176 tons gross, built in 1900; ST. PAUL, 2,029 tons gross, built in 1897; MINNEAPOLIS, 2,029 tons gross, built in 1897, and HURON, 1,945 tons gross, built in 1898.

All of the four steamers are now at Buffalo and will leave for the Atlantic coast in the spring. They will be refitted for ocean and coasting trade operations.

ST. PAUL and MINNEAPOLIS are twin steamers. They are each 238 feet long, 42 beam and depth 26 feet. Their net tonnages are respectively 1,221 tons. They are fitted with triple expansion cylinder engines, two Scotch built boilers, and have a speed of 10½ knots per hour. The main deck construction of both vessels is of wood. Each vessel has three side ports or freight gangways on each side. Their carrying capacity is fixed at about 2,100 to 2,400 tons.

The steamer HURON has a net tonnage of 1,309 tons, and was built one year later than either ST. PAUL or MINNEAPOLIS. She is 238 feet long, 27 feet depth, and is fitted with one Scotch built boiler. WILLIAM CASTLE RHODES is the largest of all four steamers taken over by the Morse syndicate, her net tonnage being 1,340, although her carrying capacity is approximately the same as that of ST. PAUL and MINNEAPOLIS.

The steamers OWEGO, CHEMUNG and J. G. McCULLOUGH, three out of four vessels sold by the Mutual Transit Co. in the summer of last year to the president of the Staten Island Ship Building Co., were likewise taken over by the Morse syndicate recently.

Articles of incorporation have been filed at Albany for the formation of seven individual corporations with titles as shipping companies to control the operations of the seven steamers taken over by the Morse syndicate.

The Norwegian steamer BYGLAND has been sold for \$325,000 to the Skib-saktieselskab Motor, Kragero, Norway. The price is almost twice the original cost. The vessel was at

Boston when sold. BYGLAND is of 1,465 tons net and was built in 1905. The old naval collier JUSTIN at Mare Island navy yard, was sold recently to John Rothschild, of San Francisco, for \$226,200. The price was more than \$150,000 over what the navy estimated she was worth.

Revive Old Ship Yards

The purchase of ship yards that have been practically idle for many years, and some of which were generally regarded as obsolete, has been one of the interesting developments of recent months, arising out of the strong demand for steamers and the revival of the ship building industry.

It is estimated that at least \$100,000,000 of new private capital has been placed at the disposal of new ship building and ship repair yards enterprises in the United States, since the war in Europe has placed tonnage on a high level of value. Not only have scores of new concerns come into existence in the ship building and ship repair trades, but the old-established ship yards on the Atlantic and Pacific seabards have, within the past 10 months, called many millions of dollars of additional capital into their employ for extensions and improvements of their plant facilities.

The Texas Oil Co. a short time ago acquired the old Sewall ship yards at Bath, Me., and will build a fleet of oil barges for its own use. The old plant of the New England Co., at North End, Me., was purchased by the Sewall interests and will be renovated.

The Newport News Ship Building & Dry Dock Co. has announced that it will expend the sum of \$400,000 in extending its plant, while the Wm. Cramp & Sons Ship & Engine Building Co., Philadelphia, has recently undertaken to add two new shipways to its ordinary facilities, as well as making other improvements.

On the Pacific coast a new ship building concern has been formed by D. E. Skinner and C. B. Lamont, formerly connected with the Seattle Dry Dock & Construction Co., known as the Skinner & Eddy Ship Building Corporation. A yard will be located by this firm at Seattle and the construction of two 5,000-ton steamers will be started at an early date.

The old Craig Ship Building Co. plant adjacent to Los Angeles, Cal., harbor, at Long Beach, Cal., at the beginning of the present year was taken over by a new concern known as the California Ship Building Co., which will renovate and enlarge the facilities there so as to be able to

contract for new steamers as long as 400 feet.

The Scottish Mexican Oil Co., which a few months ago acquired the ship yards located at Newburgh-on-the-Hudson, has also announced that business in its direction is already good, contracts having been taken for the building of a number of barges, and negotiations are pending with the Mallory Steamship Co. for a contract to build two coastwise steamers.

Eastern capitalists are reported recently to have organized a new ship building syndicate at Oakland, Cal., with a capitalization of \$25,000,000, and having 6,000 feet of waterfront holdings in their possession; they will open up extensive ship repair and building facilities at that point. W. A. Boole, former president of W. A. Boole & Sons, pioneer ship builders on the Pacific coast, is to be the president of this new corporation.

Permits Railroads to Operate Ships

A decision has been entered by the interstate commerce commission approving the operation of the steamships GREAT NORTHERN and NORTHERN PACIFIC by the Great Northern Pacific Steamship Co. on the Pacific coast. The steamship company is owned by the Spokane, Portland & Seattle Railway Co., which in turn is owned by the Great Northern and the Northern Pacific railroads. The commission held that the "service of the Great Northern Steamship Co. is in the interest of the public and is of advantage to the convenience and commerce of the people. A continuance of same will neither exclude, prevent nor reduce competition on the route by water and should be permitted." The ships operate between Flavel, Ore., and San Francisco.

NORTHERN PACIFIC and GREAT NORTHERN are sister ships. Each is 524 feet in length over all, 63 feet beam, 50.8 feet depth, with a tonnage of 8,225 tons. Each has a carrying capacity of 856 passengers and 2,185 tons of freight. They are triple screw steamers, each equipped with 25,000 horsepower turbine engines, and have a guaranteed speed of 23 knots an hour and a maximum speed of between 24 and 25 knots. The contracts for building them were made in April, 1913, by the Spokane, Portland & Seattle Railway Co. with the William Cramp & Sons Ship & Engine Building Co., Philadelphia. The contract price was \$1,945,000 for each ship. GREAT NORTHERN was completed Jan. 27, 1915, NORTHERN PACIFIC was completed March 25, 1915.

On the Coasts, Lakes and Rivers

What's Doing and Who's Doing It

Up and Down the Great Lakes

By A. A. Eiben

THE anxiety of Great Lakes vessel owners and managers to have their fleets in readiness for an early start in the coming season, has caused a rush in the steamboat inspection offices. A large number of vessels have been lined up for inspection during March and April, and local inspectors in the Great Lakes district will be given additional help in order to get the freighters out on time. Henry L. Simpson, assistant inspector of boilers, Norfolk, Va., has been ordered to Cleveland to assist in that district, and other changes are being made to facilitate dispatch.

The Bristol Transit Co., capitalized at \$290,000, was recently incorporated at Columbus, O., by Capt. W. C. Richardson, E. W. Oglebay and D. Z. Norton. The new company will operate the steamers SENATOR and COLONEL, recently purchased from P. H. McMillan, vessel manager, Detroit.

At the annual meeting of the grand lodge of the Ship Masters' Association, held at Toronto recently, the following officers were elected; William J. Crosby, Detroit, grand president; A. W. Stalker, Toledo, grand vice president; John McDonald, Marine City, grand treasurer; Walter D. Hamilton, Chicago, grand secretary. The next meeting of the grand lodge will be held in Cleveland.

At a meeting of the directors of the Pittsburgh Steamship Co., A. F. Harvey and E. C. Collins were elected vice presidents. Mr. Harvey is assistant general manager and Mr. Collins is traffic manager, and both have been connected with the Pittsburgh company since it was organized.

In line with the ruling of the interstate commerce commission, divorcing the boat lines from the railroads, employees of the package freight lines have received definite notice that their services will no longer be required after March 31.

Frank M. Van Liew, local United States inspector of boilers at Port Huron, died recently. Mr. Van Liew had been a federal marine boiler inspector for 25 years.

Thomas F. Falkner, superintendent of the Pittsburgh Coal Co.'s dock at Ashland, has been appointed manager of the Port Royal Dock Co. at Sault Ste. Marie, Mich.

The car ferry PERE MARQUETTE No 19, which grounded on Big Point Sable, Lake Michigan, in January, was released and towed to Ludington. The damage

to the ferry is estimated at \$60,000, but her cargo was not harmed. She will be in dry dock for a considerable time.

James Fellows, formerly manager of Miller's coal dock, Port Huron, Mich., died suddenly on Jan. 28.

The annual meeting of officials, masters and engineers of the Pittsburgh Steamship Co. will open at the Hollenden hotel, Cleveland, March 27, continuing four or five days. Wages and other matters in connection with the operation of the vessels of this fleet will be taken up.

The new 9,000-ton steamer, to be built at the Lorain yard of the American Ship Building Co. for M. A. Hanna & Co., and which will go into commission in September, 1916, will be named in honor of H. F. Black, a director of the Cambria Steel Co.

George W. Bach, instructor of the engineering school maintained by the Lake Carriers' Association, has resigned, to become general manager of the Union Iron Works, Erie, Pa. David Gaehr, consulting engineer, has succeeded Mr. Bach.

A storm signal tower for the benefit of vessel men is to be erected and equipped at Sandusky. It is to be 50 feet high, of concrete and steel construction, and will maintain signal lights heretofore shown from the top of a staff on the roof of the federal building. The tower will be ready before the opening of navigation.

Work is progressing on improvements at the coal docks of the Zenith Furnace Co., Fifth Avenue West and Bay Front, Duluth. A 300-foot extension to the docks, with a rearrangement of the coal handling system, will give the dock an added capacity of 125,000 tons annually. The work will be completed before the opening of navigation on the Great Lakes.

The Lumber Carriers' Association of the Great Lakes elected the following officers at its annual meeting in Detroit; O. W. Blodgett, Bay City, Mich., president; Henry McMorran, Port Huron, first vice president; Fred P. Potter, Cleveland, second vice president; W. E. Holmes, Chicago, third vice president; W. D. Hamilton, Chicago, secretary-treasurer.

The demand for tonnage on the Great Lakes continues unabated and lake ship yards are closing additional orders for vessels for 1917 delivery. The Toledo Ship Building Co., Toledo, recently

closed contract with a Norwegian interest for four vessels for 1917 delivery. This brings the total of vessels under order for 1917 delivery up to eight, and it is understood that several other contracts will be announced later.

In addition to the list of lake vessels recently sold, which appeared in the February issue of *The Marine Review*, a number of vessels have changed hands, including the following; Steamer SPOKANE, sold by the Reid Wrecking Co., Sarnia, Ont., to coast parties; steamer OCEANICA, sold by Tonawanda Iron & Steel Co. to Captain John O'Hagan, Tonawanda; steamers INLAND and J. B. KETCHUM, sold by Reid Wrecking Co., Sarnia, to Roy M. Wolverine, Duluth; steamer FERDINAND SCHLESINGER, sold by Wisconsin Steamship Co., Milwaukee, to Captain Chester Massey, Superior, Wis.; steamer MAHONING, sold by Anchor Line, Buffalo, to eastern parties for service between Philadelphia and Cuba; steamer JESSE SPALDING, sold by Harvey-Morrison Co., Cleveland, to New York parties; steamer NORMANIA, sold by Ashtabula Steamship Co. to Captain W. C. Richardson, Cleveland, O.; steamer JOHN J. McWILLIAMS, sold by Gratwick Steamship Co., Cleveland, to E. F. Smith, Central West Coal Co. Menominee, Mich.; steamer MOHAWK, sold by Western Transit Co., Buffalo, to Crosby Transportation Co., Milwaukee. This brings the total vessels sold since Oct. 1, 1915, up to 66.

Delaware River Notes

By Dr. C. S. Street

CAPTAIN A. PEGG of the Italian steamship BOLOGNA recently brought his craft to the new dock of the DuPont Co., Carney's point, N. J., to load with nearly \$500,000 worth of ammunition for the Italian government. BOLOGNA has the distinction of being the first ocean-going vessel to dock at the new pier.

The super-dreadnought OKLAHOMA recently arrived at the New York Ship Building Co.'s plant, Camden, N. J., after her speed trials off the coast of Maine.

The Italian bark ERA recently reached Philadelphia after a 103-day voyage, during which she nearly turned turtle several times in heavy storms. She will be repaired and will load with coal for Italy.

The Chester Ship Building Co. has recently received contracts for about \$6,000,000. This new contract work brings the company's total of new

orders up to \$8,000,000. The Norwegian Ship Building Co. has two of its new vessels partially finished on the ways. Six new additional ways are now being constructed in order that the new work may progress immediately.

Around the Golden Gate

THE Oakland estuary is fast becoming a ship building industrial center following the greatly increased demand for vessels for use in coastwise and offshore shipping. The purchase of the United Engineering Co. works by the Union Iron Works, of San Francisco, means that a great deal of money will be spent in enlarging this already well equipped institution. Moore & Scott have gone after some big building contracts and at the present time have two big freighters under way, the contracts running up around the million-dollar mark. One of these boats is for the Ralph Coal & Navigation Co. and is to be a sister ship of *ANNETTE ROLPH*, now under construction at another yard. She will be a steel steamer, 376 feet long, with a tonnage of 9,350. Moore & Scott also landed a contract to construct a 7,100-ton steamer along the lines of the Ralph boat, for a Norwegian firm, represented by Geo. W. McNear, San Francisco.

* * *

Another ship building plant is proposed for Oakland and the promoters have been granted permission by the state commissioner of corporations to sell stock in a company capitalized at \$600,000. J. J. Barnes, of the J. D. Barnes Co., San Francisco, which is backing the new proposition, state that half the stock has already been subscribed. The company contemplates the purchase of 14 acres in the Oakland estuary for \$75,000 and to construct on its ways and machine shops with a capacity of turning out steamers up to 4,000 tons.

It has been reported that an eastern syndicate, capitalized at \$25,000,000, proposes to construct a plant along the estuary within the present year. The new corporation is said to be an outgrowth of the Standard Ship Building Corporation, New York, recently formed. Negotiations are said to be progressing favorably.

* * *

A number of the coastwise lumber carriers which on account of the stagnation in the lumber industry were diverted to other lines of shipping, are now being withdrawn and put back into their regular service. One of the notable instances was the steel steamer *NANN SMITH*, owned by the C. A. Smith Lumber Co., and used in the run between Coos Bay and San Francisco. She had made two trips in the Chilean nitrate trade under charter to W. R. Grace & Co.

* * *

The demand for bottoms to carry a largely increasing trade to West Mexican and Central American ports from San Francisco, has resulted in the chartering of the North Pacific Coast steamer *GEORGE W. ELDER*, by the California South Seas Transportation Co., to be added to its fleet of seven vessels. This company organized during the past year, has seen a large business built up.

* * *

THE British steamship *SINGAPORE*, outward bound for Glasgow, ran ashore inside Smith's Point, at the mouth of the Potomac, Jan. 11, but was floated the next day and proceeded to sea. The ship is reported undamaged.

* * *

The British steamship *PRESTFIELD*, bound from Tyne, England, for Baltimore, ran aground outside the Virginia capes, Jan. 13. A wrecking steamer from Norfolk managed to release her without material damage. *PRESTFIELD* is chartered to load grain for European ports, and is owned by the Pearcey Steamship Co., Newcastle. She was built in 1901, and is of 4033 gross tons register.

* * *

The first full cargo of grain from the recently completed concrete elevator of the Western Maryland Railroad at Port Covington, was recently loaded into the Danish Steamship *TUBORG*. *TUBORG* took 14,000 quarters, consigned to Copenhagen. She was followed by the British steamship *GLENRAZAN*, which took a full cargo for British ports. This is the initial venture of the Western Maryland Railroad in grain shipments. Previously, all grain from Baltimore was handled by the Baltimore & Ohio and the Northern Central Railroads.

* * *

For the first time in Baltimore's history, coal has been brought to that port for local consumption. Owing to the freight embargo on several of the railroads, the Maryland Steel Co. was forced to get coal from Norfolk. The tug *DAUNTLESS* brought in the first con-

signment, in the barges *J. H. MARVILL*, *SAFETY* and *C. T. ROWLAND*. The fleet of tugs and barges owned and operated by the Consolidated Coal Co. have been forced for the first time in many years to load at Norfolk.

* * *

Col. John Biddle, U. S. Engineer in charge of the Baltimore district, recently went to Crisfield to hear arguments in regard to improving the channel approaches to Pocomoke City on the eastern shore of the bay. The hearing was requested by the Pocomoke board of trade.

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Wreckers are pumping out and floating the hull of the steamer *TIVOLI*, which was burned and beached near Thomas point. The hull will be brought to Baltimore and will be converted into a barge.

* * *

Baltimore longshoremen recently went on strike for an increase of wages, and for some days the situation was serious. The disagreement was settled and the men returned to work, having been actually out for one day.

* * *

The British steamship *GORDON CASTLE*, which arrived at Baltimore recently from Bombay and Cape Town, brought a large quantity of bullion and other valuables, which were transhipped to Canada. A heavy guard was kept on *GORDON CASTLE* while in port until the valuable cargo was discharged. Two British cruisers convoyed the ship across the Atlantic, leaving her at the Virginia capes.

In New York Harbor

By George Nicholson

THE former steamer lighter *HELEN M. FIELDS*, built a few years ago in 1904 for Arbuckle Bros., and a vessel of 321 gross tons, and which recently had been purchased by the Anglo-American Oil Co., has been rebuilt into a tug, and her name changed to *LIMA-LIGHT*. She steamed for Talara, Peru, via the Panama canal, a few days ago and will serve as station boat on Talara bay under the Peruvian flag.

* * *

A new coastwise transporting service was started in January by the Cullen Transportation Co. Six barges are to be employed in this service, and the first of these, the *CATHERINE W. CULLEN*, 2,000 tons, was built by the Walter Moore Dry Dock Co., Baltimore, Md. The other barges will be completed shortly.

* * *

Until the permanent opening of the Panama canal, the Atlantic Transportation Line will put the four steamers recently purchased from the Pacific Mail Co., together with *FINLAND* and *KROONLAND*, under the American flag in the New York-London trade.

* * *

The five-masted schooner *KINEO* has been purchased by the Texas Co. for \$85,000 and will be converted into an

auxiliary motor ship by the installation of two 320 horsepower Bolinders hot bulb engines, driving twin screws. She is a vessel of 2,128 gross tons, 259 feet, five inches long, and built at Bath, Me., in 1903.

* * *

The new Munson Line steamer *MUNAMAR*, built by the Maryland Steel Co., Sparrow's point, Md., was recently placed in service.

* * *

An excellent indication of the value of tonnage at the present time was shown by the recent sale of the Clyde liner *NAVAHOE*. The steamer *NAVAHOE*, which at one time was owned by the Clyde line, was recently sold to Hartfield, Solari & Co. for \$60,000, and resold later to R. Lawrence Smith for \$120,000. The vessel is now at Bermuda with a cracked cylinder head, having put in there while on a voyage to Italy. An offer of \$140,000 has been made for the vessel, delivered at New York. Her cargo will be forwarded to its destination by the bark *ANNA MARIA D'ABUNDO*. *NAVAHOE* was formerly the *THURINGA*, and was built at Hamburg, Germany, in 1880.

* * *

Four steel barges belonging to J. B. King & Co. and which have been

engaged in transporting lime to this port from Nova Scotia, are now at the yard of the Staten Island Ship Building Co., being converted into motor vessels by the installation of two 160 horsepower Bolinders hot bulb direct reversible oil engines, driving twin screws. These barges, which were built at Wilmington, Del., in 1901, are of 1,120

gross tons each. When converted they will trade on their former route.

* * *

The steam lighter MANHASSETT, owned by the Manufacturers & Merchants Lighterage Co., is being converted into a motor vessel by the installation of a 320 horsepower Bolinders direct reversible four cylinder hot bulb oil engine.

passage of a law requiring all builders of passenger vessels to submit their plans and specifications to the federal authorities before beginning construction work. Capt. Anderson contends that if the plans and specifications had to fulfill certain safety requirements, unsafe vessels could not be constructed.

* * *

William J. Hingston, marine architect and builder, Buffalo, is at present in Portland, Ore., and is making his headquarters at the plant of Joseph Supple.

* * *

After plying on the Bering sea route out of Seattle for nearly fifteen years and bringing many millions of dollars worth of gold from the mining camps of the Northland, the Nome liner SENATOR has been ordered withdrawn from this service. Officials of the Pacific Coast Steamship Co., owners of the famous craft, which has been called "the Nome gold ship," have decided to operate the steamer UMATILLA on the Seattle-Nome route. UMATILLA has recently been converted into an oil burner.

* * *

To take care of growing business, the Pacific Tow Boat Co., Seattle, which is engaged in log towing on Puget sound, will add four or five tugs to its fleet during the present year.

Around Puget Sound

By F. K. Haskell

WORK at the Seattle Construction & Dry Dock yards, Seattle, exceeds every former high mark, declare company officials. Two 5,000-ton steel freighters are being built for the Ward Co. as well as three submarines and one torpedo boat destroyer for the United States navy and a number of smaller craft.

* * *

At the Dockton shipyards of John Martinich, the Washington Steamboat Co. of Seattle is having constructed a passenger carrying steamer, 122 feet in length, 18-foot beam and 7-foot draft. The estimated cost of the hull is \$10,000.

* * *

The Blue Funnel liner POLYPHEMUS recently arrived at Puget sound from England; this is her first voyage to the Pacific Coast. She is commanded by Capt. Arrowsmith.

* * *

Two more steamships have been chartered by Frank Waterhouse & Co., Seattle, for operation over the Seattle-Vladivostok route. They will load on Puget sound during March and April, taking capacity cargoes for the Siberian port. The addition of the two vessels will materially strengthen the great fleet of chartered vessels now operated by the Waterhouse firm on the trans-pacific route. With these new vessels the company will have nineteen sailings from Seattle during the first months of the year.

* * *

The commerce of the district of Washington for December, 1915, once more broke all previous records. The value of foreign imports and exports for the month reached the sum of \$20,370,000, an increase of more than \$1,000,000 over November.

* * *

The Astoria, Ore., port commission has voted to build and maintain a municipal steamer service between Astoria and upper Columbia river points. Port bonds to the amount of \$250,000 will be offered and steamers chartered until sufficient craft are built by Astoria capital. Thirty merchants of the city pledged themselves to support the municipal line. The service will start in February.

* * *

Because of the great scarcity of vessels on the Pacific, the Nome liner VICTORIA, of the Alaska Steamship Co., which usually lays up during the winter months, is to enter the southwestern Alaska trade. She will load one million feet of ties for the Copper River & Northwestern Railroad Co. at Port Blakely. VICTORIA is in command of John A. O'Brien, her veteran master. Fabulous charter rates were offered for VICTORIA but they were all refused, as

the Alaska Steamship Co. is anxious to move railroad supplies and other freight to southwestern Alaska, and to bring out copper ore.

* * *

The new Bering Sea Packing Co., recently organized by Puget sound capitalists headed by Capt. Harry W. Crosby, of Seattle, has purchased the small steamship RUSH, once famous as a revenue cutter, from F. W. Wonn.

* * *

As a means of reducing the possibility of passenger steamboat and steamship disaster to a minimum, Capt. John L. Anderson, president of the Anderson Steamboat Co., Seattle, advocates the

Boston Bay Doings

By G. S. Hudson

THE France-Canada line has undertaken to deliver 50,000 horses to the French government, and a number of liners with temporary accommodations for the animals have been chartered. A ship of the type of ULTONIA and LUCERIC can carry nearly 2,000 horses with but small percentage of loss. The movement of cereal by the France-Canada line is heavy and quantities of steel billets are included in cargoes. St. Nazaire, France, is the destination of the carriers, which return to this port in ballast trim.

* * *

A novel fate is in store for the old coast guard cutter WOODBURY, which was recently purchased by a Boston junk dealer. The hulk is to be fitted with a small gasoline motor and taken to Labrador by a motion picture concern, where she is to be sent full tilt against an iceberg for a thriller. WOODBURY will be accompanied by another vessel. She is 50 years old, and has been replaced by OSSIEPEE, stationed on the Maine coast.

* * *

The five-masted schooner BAKER PALMER, owned by J. S. Winslow & Co., Portland, Me., foundered while in passage from Boston for Buenos Ayres with a 4,000-ton cargo of coal. Capt. Dunton and crew were rescued and landed at Buenos Ayres by the Boston sailing ship RHINE, Capt. Bray.

* * *

Capt. J. I. Kemp, formerly master of the Boston harbor tug CONFIDENCE, commanded the superdreadnaught OKLAHOMA in her speed trials off the New England coast.

* * *

The first direct sailing from Boston to Denmark was that of the Danish steamship TULA, Capt. Terkeldsen, last

month. TULA carried general cargo for Copenhagen.

* * *

J. S. Carder has been appointed general freight and passenger agent of the Eastern Steamship Corporation.

* * *

Fishermen are disappointed at prices received for tilefish, notwithstanding the publicity recently given that species by the United States Bureau of Fisheries. The schooner HORTENSE, which recently trawled 16,000 pounds of tilefish from the gulf stream, received but 5 cents per pound.

* * *

Grain shipments to Europe continue heavy, though some difficulty is experienced in filling reservations on account of delay to liners incident to rough weather. For the first week of February there were booked to European ports 1,700,000 bushels of wheat, corn, oats and barley, several full cargoes consigned to the Greek government having been taken to Piraeus.

* * *

Boston longshoremen are working under a new wage scale, whereby the men receive an increase of 5 cents per hour for handling grain and 2 cents per hour for general and bulk cargo. The old agreement signed by the agents of transatlantic steamship companies and the longshoremen's union, was worked under without apparent dissatisfaction, and conferences held at the close of 1915 brought out very little acrimonious discussion, the agents readily agreeing to the increase, in view of prosperous conditions.

* * *

The Boston fishing schooner VANESSA is reported as sold to Buren, N. F., interests and will be operated in the general coasting trade.

Red Hot Tips From the Trade

Pertinent Suggestions and Personal Gossip

THE Pneumercator Co., New York, has installed tank measuring equipment on the new steamers VESTA and SCULLY, owned respectively by the Standard Transportation Co. and the Mexican Petroleum Co. Pneumercators also have been installed on the Mississippi river barges that have recently been put in service by the Inland Navigation Co. of St. Louis and New York. The government tank steamers KANAWHA and MAUMEE, built at Mare Island, Cal., are equipped with pneumercators, and similar installations are to be made on the United States navy transport building at the League Island navy yard, as well as on the battleships recently authorized which are to be built at the New York and Mare Island navy yards respectively. In addition, the navy is using pneumercators to measure bunker fuel oil in the large storage tanks which are being erected at various naval stations throughout the world.

Pump Company Busy

The Blackmer Rotary Pump Co., Petoskey, Mich., is operating its plant night and day and also has ordered additional machine shop equipment which will double its capacity. This concern therefore is in a stronger position than ever to handle marine business, on which it specializes. The Blackmer company manufactures a rotary pump which requires very little space and, it is stated, not only perform the services of a bilge pump satisfactorily, but also furnishes a strong stream for washing down decks and for fire protection.

Forms Welding Company

The Commercial Welding Co., recently incorporated to engage in all kinds of welding, has completed a plant at 11 Alling street, Newark, N. J. Included in the company's apparatus are several welding equipments which consist of an arc-welding dynamo, driven by a gasoline engine, both of which are mounted on a sub-base, constituting a unit. For transporting these units to marine repair yards and other points the company has provided a motor truck. The company is about to install electric spot-welding machines capable of handling $\frac{1}{2}$ -inch plates; butt welding machines to weld bar stock up to 2

inches square, oxy-acetylene equipment for welding and cutting, and other equipment. J. W. Raynor is general manager of the Commercial Welding Co.

Granted Injunction

The Marconi Wireless Telegraph Co. of America has secured a temporary injunction from Justice Veeder, of the district court of eastern New York, restraining the American - Hawaiian Steamship Co. from using the wireless apparatus now installed on the steamship FLORIDIAN. Several other suits for alleged infringements of the Marconi company's patents on transmitting and receiving apparatus, are pending in the New York, Wisconsin and Washington courts.

Engberg Catalogs

Engberg's Electric & Mechanical Works, St. Joseph, Mich., has issued two attractive bulletins describing its direct-connected generator sets and searchlights, respectively. The bulletin devoted to dynamos and engines contains detailed descriptions and illustrations of the design and construction of this equipment. In the second bulletin, the Engberg company points out that its searchlight projectors have been in successful operation for more than 16 years. Illustrations and descriptions show in detail the construction of these searchlights.

Isherwood Construction

A large number of orders for vessels to be built on the Isherwood system have been placed in the United States recently. Figures compiled by J. W. Isherwood, 4 Lloyd's avenue, London, E. C., England, indicate that at present nearly 450 vessels aggregating 2,084,892 gross tons register are being constructed under this system. In this estimate 167 general cargo vessels, 187 tankers, 43 barges, 21 colliers, 16 Great Lakes freighters, nine passenger vessels, two dredges and a trawler are included.

In Great Britain 135 Isherwood licenses were issued during 1915, covering vessels with a gross tonnage of 615,315. It is also stated that 22 vessels which have been recently contracted for in Japan will be built on the Isherwood system.

Use of Graphite

The Joseph Dixon Crucible Co., Jersey City, N. J., has issued a 24-page pamphlet covering the use of graphite in steam boilers, particularly of the water tube type. It is stated that the action of the graphite is not chemical and that it does not attack the metal. Particles of graphite simply work through the minute fissures existing in the scale and gradually penetrate between the scale and the metal. The scale, thus loosened, may be rapped off or removed with ordinary cleaning tools with little trouble.

Describes Dake Products

The Dake Engine Co., Grand Haven, Mich., has issued a complete 48-page catalog illustrating and describing its line of products. The section of the catalog devoted to marine equipment, describes the Dake steering engine, brass standard, boiler testing pump, power capstan, steam net lifter, elevator and gang plank hoists, steam capstan, anchor windlass, spud hoists, boiler, engine and motor. All of this equipment is handsomely illustrated.

Illustrates Berths

The Southern Bedding Co., 617 West Pratt street, Baltimore, has issued an attractive wall calendar, on the reverse side of which appears an illustration and description of one of the several types of steamship berth manufactured by this concern. The berth illustrated is designed particularly for installation in crew's quarters, third-class cabins, or wherever a standing berth is required. These berths may be easily taken down and stowed away in small space, if desired.

Grant Diesel Licenses

T. O. Lisle, American representative of the Netherlands Engineering Co., Amsterdam, Holland, manufacturer of the Werkspoor diesel engine, has announced that the New York Ship Building Co. and the Newport News Ship Building & Dry Dock Co. have been granted licenses for the construction of the Werkspoor four-cycle diesel type motors in the United States.

Equipment Used Afloat and Ashore

Marine Type Generating Set—Automatic Whistle Control

THE accompanying illustration shows a vertical cross section of a steam-driven marine-type generating set, built by Engberg's Electric & Mechanical Works, St. Joseph, Mich. This unit is built in a range of sizes from 6 to 15 kilowatts, and the designer has made an effort to free both the engine and generator from unnecessary complication and to provide easy and positive means of adjustment and ready accessibility to all working parts. Removable side doors are provided on each side of the engine frame, allowing access to the crosshead, wrist pin and adjacent parts; the hand hole plates on the opposite sides of the engine frame give access to the lower end of the connecting rod. The engine is equipped with a balanced piston valve. The fly wheel is so designed as to retain the greater part of the weight up close to the main bearing of the engine frame, to some extent relieving the breaking strain on the shaft. The governor, designed by the builders of the engine, is constructed to control the speed within 2 per cent from no load to full load. The engine is equipped with an automatic lubricating system. The generator is constructed according to modern electrical standards and the material for the field frame and pole pieces is

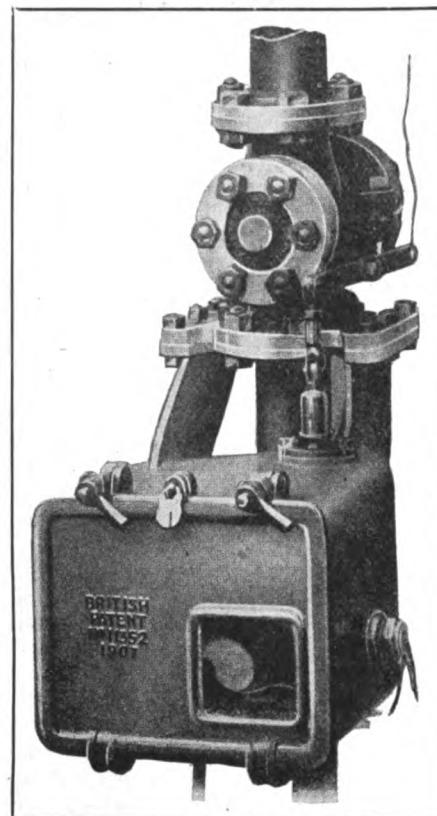


FIG. 1—SECTIONAL VIEW OF MARINE-TYPE GENERATING SET

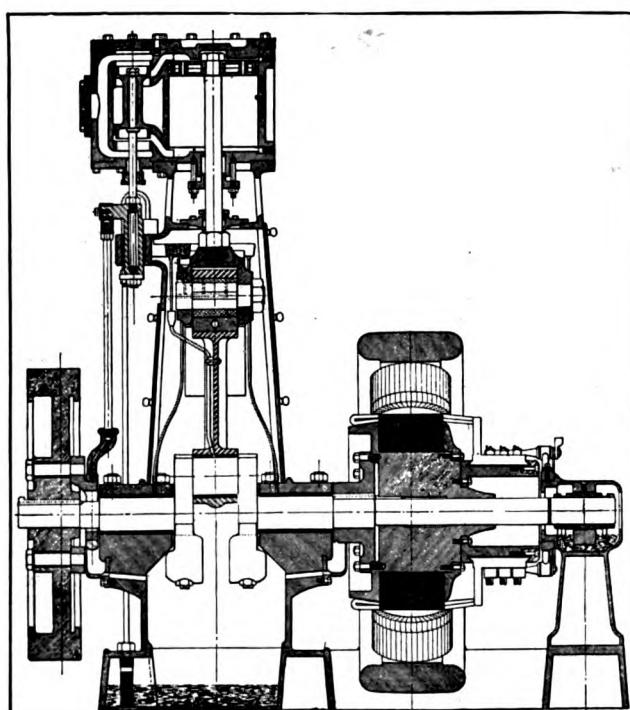
specially selected for the high magnetic permeability of the metal employed. In addition to the set shown in the

accompanying illustrations, Engberg's Electric & Mechanical Works constructs marine generating sets in sizes ranging from 1 to 3½ kilowatts and also from 15 to 50 kilowatts. The company also manufactures search-light projectors, switchboards and other auxiliary apparatus.

Whistle Control

The McNab Co., Bridgeport, Conn., manufacturer of steamship specialties, has developed the Willett-Bruce automatic whistle control, the details of which are shown in the accompanying illustration. This device is operated electrically, but should the electrical plant on the ship be temporarily out of order, the ordinary lanyard gear may be used; in fact it can be used with the automatic gear, if desired.

The McNab Co. also manufactures a direction and revolution indicator. This device enables the captain to see that his engine room orders have been instantly and correctly carried out. It indicates the number of revolutions ahead and also shows whether the screw is working forward or backward. It is stated that 90 per cent of the vessels now under construction in the United States will be equipped with these indicators, which are built in four different styles.



WILLET-BRUCE AUTOMATIC WHISTLE CONTROL
BRITISH PATENT NO. 11522

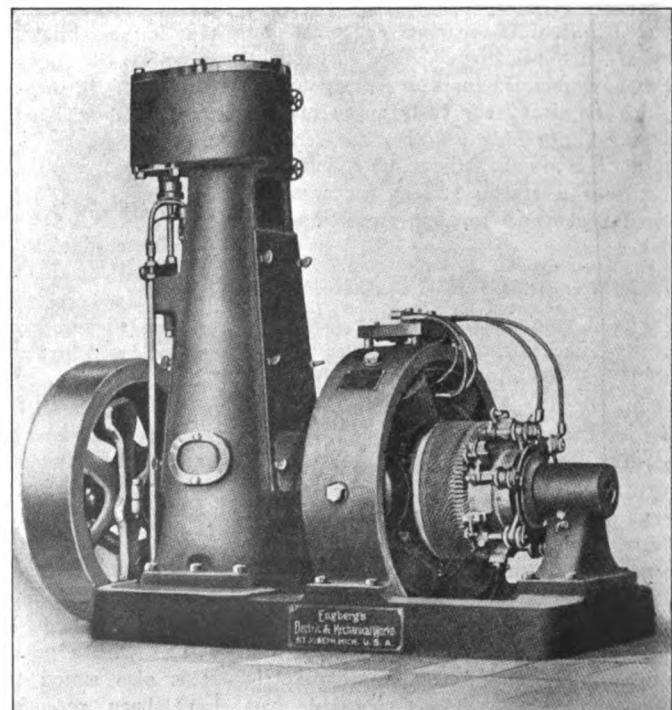


FIG. 2—MARINE-TYPE STEAM-DRIVEN GENERATING SET

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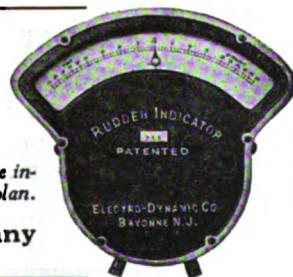


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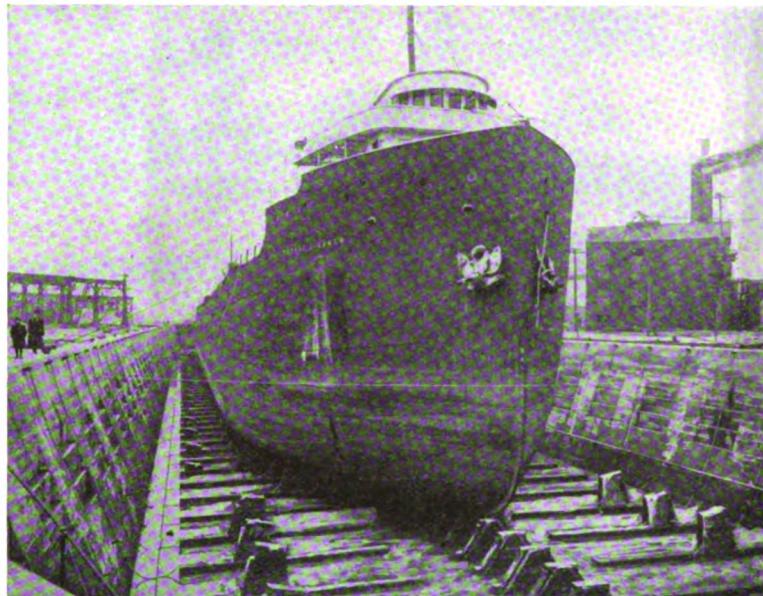
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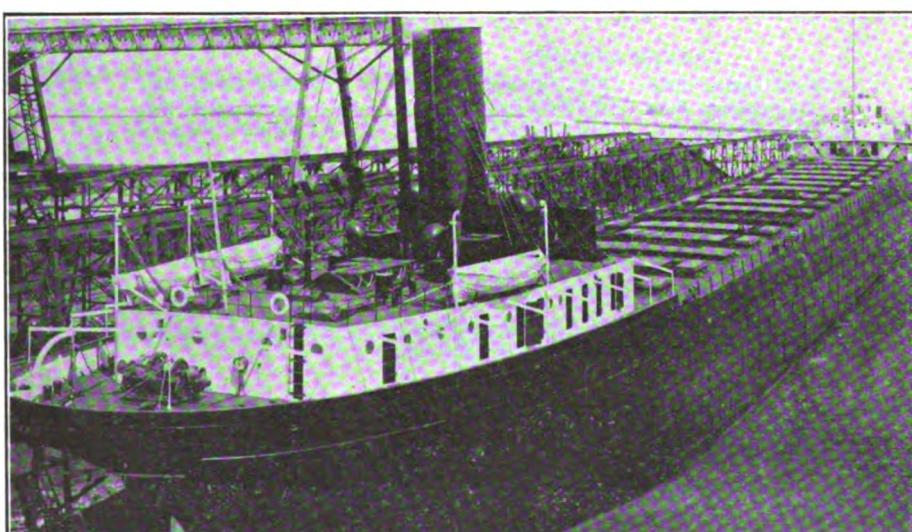
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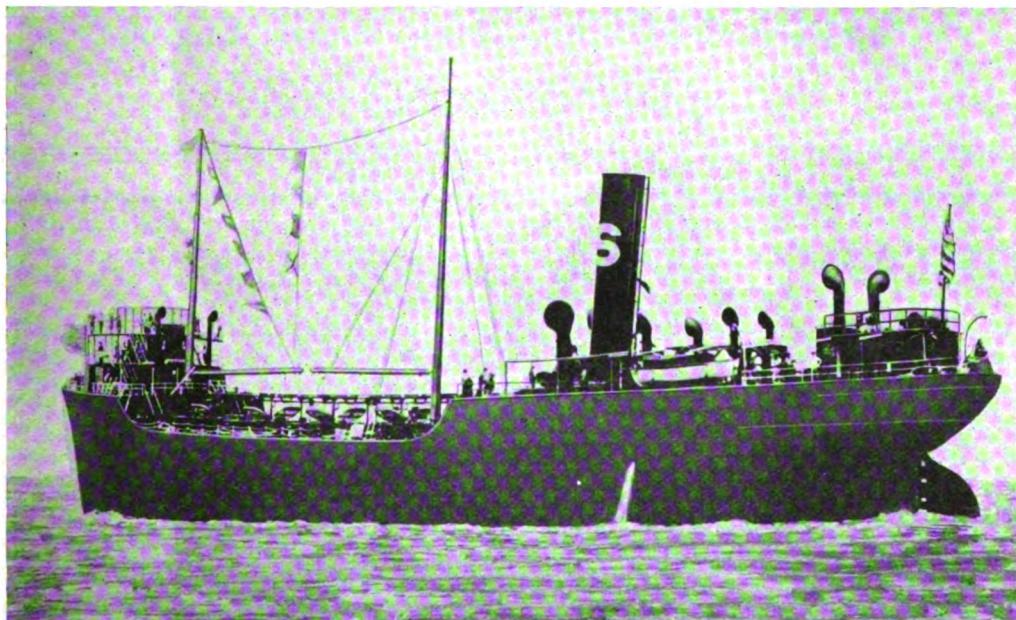
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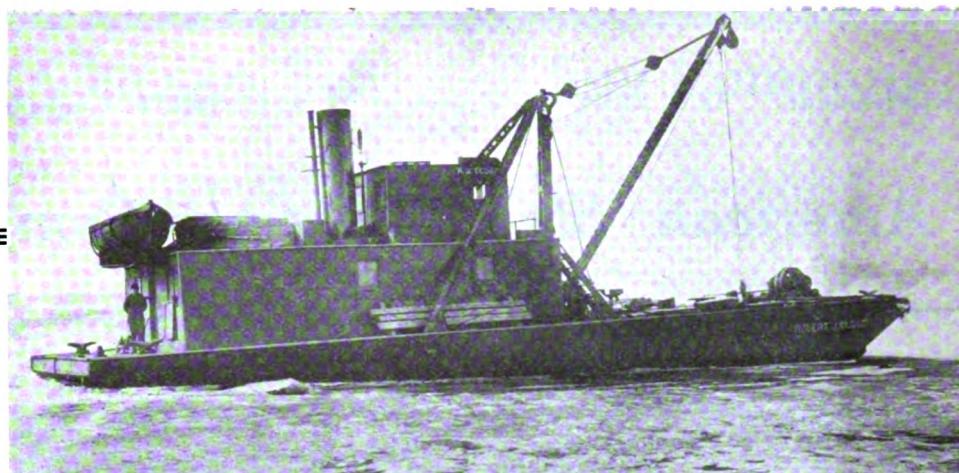


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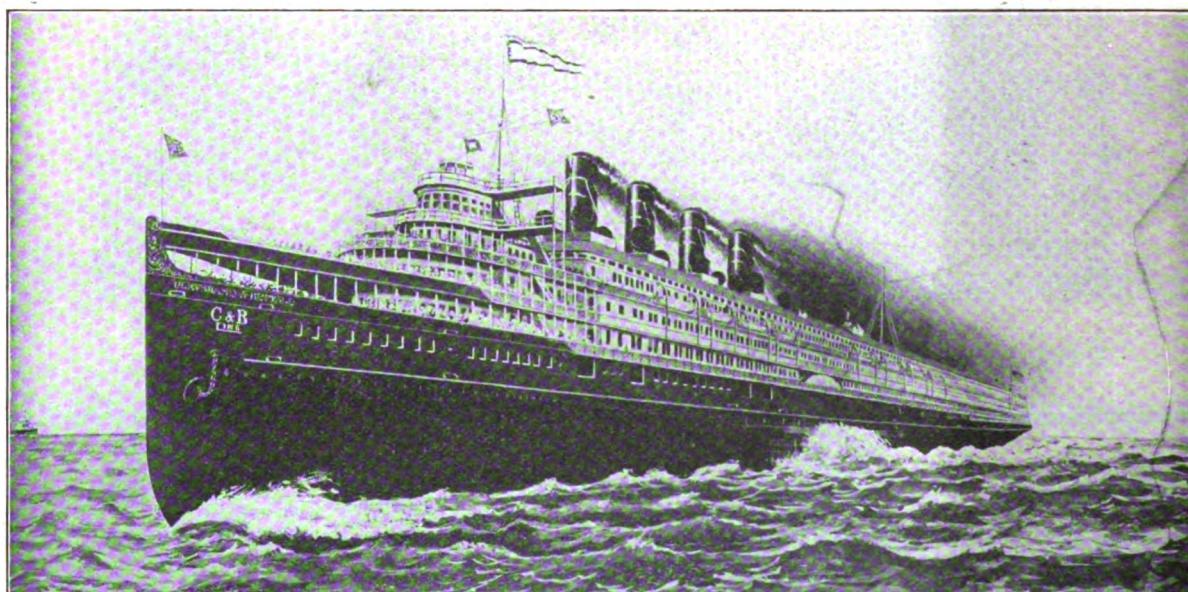
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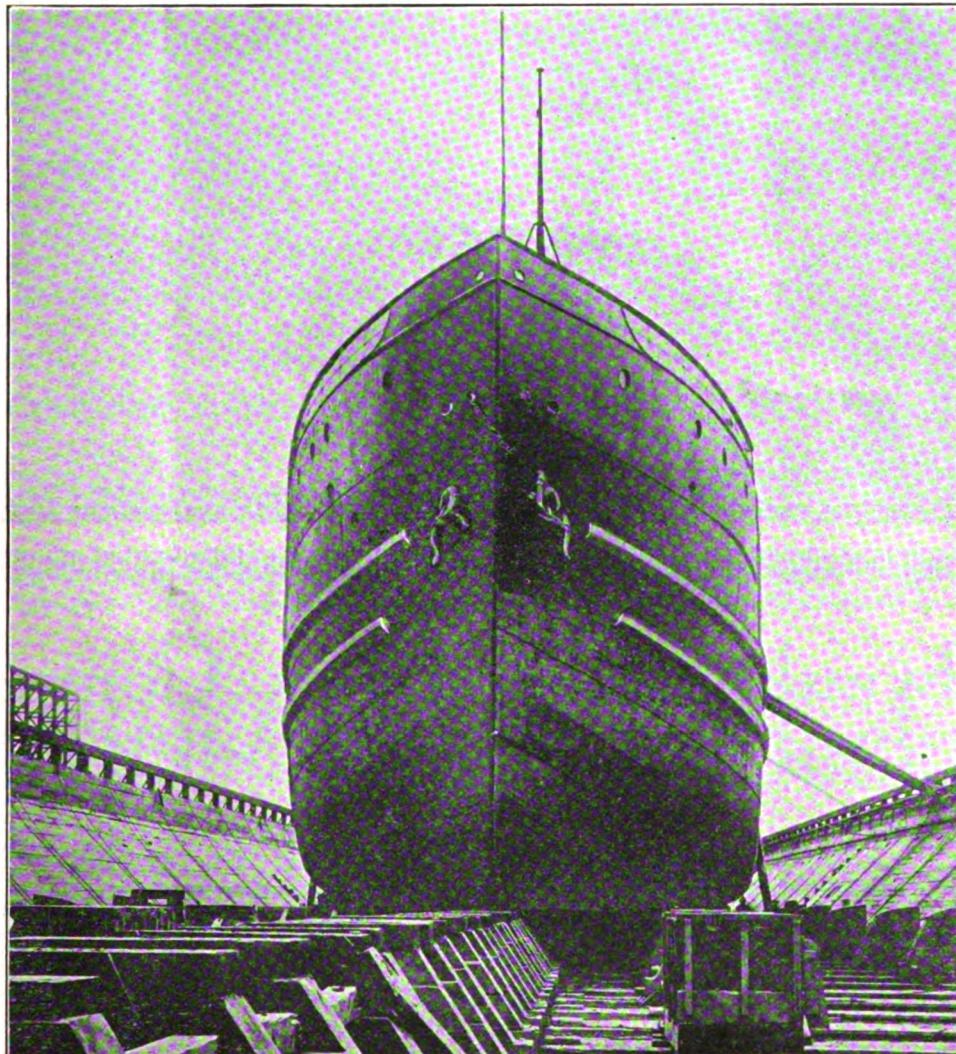
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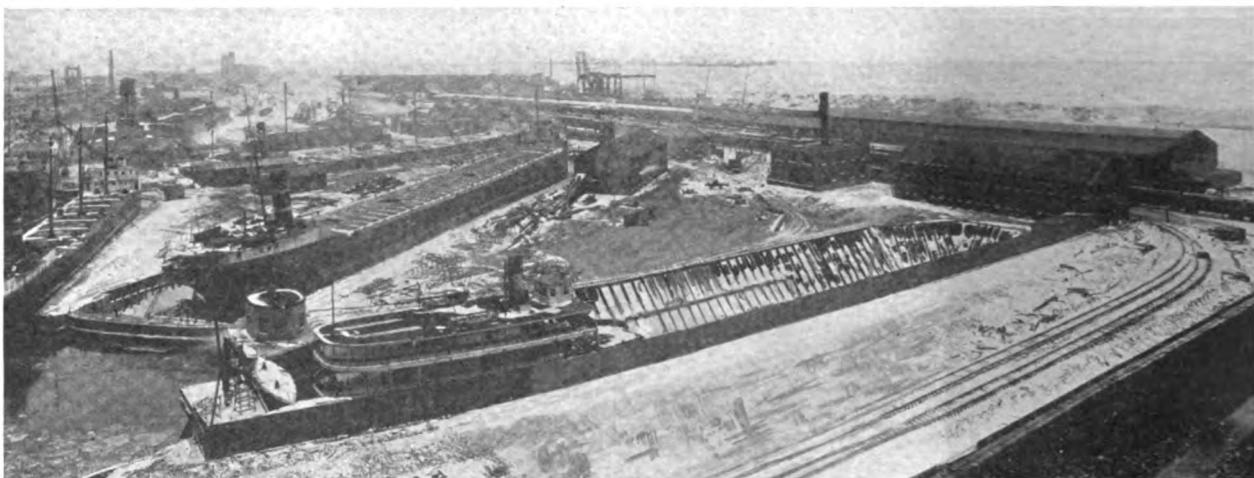
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Milwaukee Dry Dock Company

Milwaukee, Wisconsin

Ship Repairs of All Kinds

Also Machine Shop for Engine Repairs

We have two ship yards offering every facility for the repair of both steel and wooden vessels. South Yard Dock is 450 feet long on keel blocks; 460 feet over all; 60 feet width of gate and 16 feet over sill. West Yard Dock is 312 feet on keel blocks; 45 feet width of gate and 12 feet over sill. Rudder pit in each dock. Electric light for night work.

Residence Phone
F. W. Smith, Manager
Lake 467

Main Office at South Yard
Foot of Washington Street

Telephone—Hanover 3
West Yard—Hanover 2555

Please mention THE MARINE REVIEW when writing to Advertisers

OUR DRY DOCKS SAVE TIME

Two Docks, coupled with Complete Shop Facilities, cut repair periods to a minimum

Length on Keel Blocks, feet
Width of Dock Floor, feet
Draft Over Sill at Low Water

	Upper Dock	Lower Dock
600	437	
62	50	
22½	22½	

CARGO CARRIERS EARLY DELIVERIES

Two New Building Slips now under construction will take Vessels up to 325 feet long, 50 feet beam and 32 feet deep. Overhead Cranes speed up the job. We have other Building Slips for smaller Craft.

Baltimore Dry Docks and Shipbuilding Company
BALTIMORE, MD.
CABLE ADDRESS—BALTODOCKS, U. S. A.

Tietjen & Lang Dry Dock Co.
HOBOKEN, N. J.

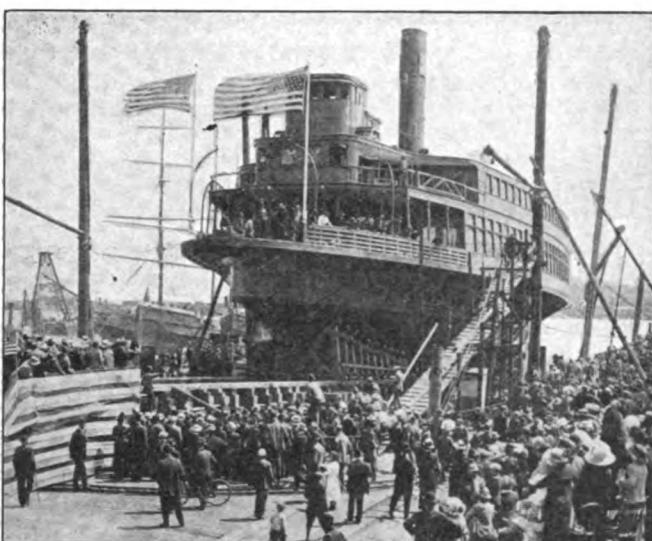
NINE DRY DOCKS

600, 800, 1,000, 1,200, 1,400, 1,800, 2,000,
6,000, 10,000 TONS

General Repairs on Wooden and Iron Vessels
FT. OF 17th STREET

Telephone 700 Hoboken **HOBOKEN, N. J.**

Please mention THE MARINE REVIEW when writing to Advertisers

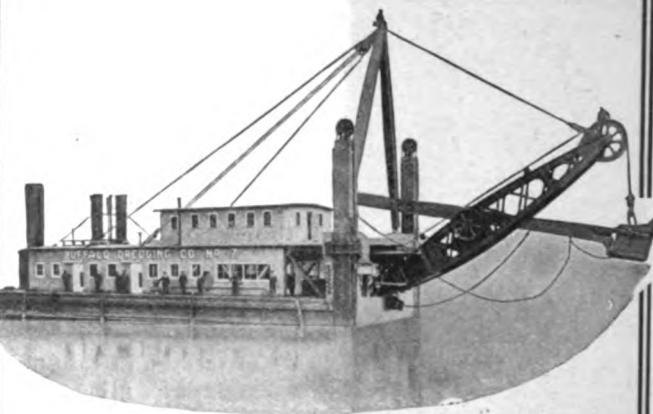


Moore and Scott Iron Works

Engineers and Ship Builders

SAN FRANCISCO, CAL.

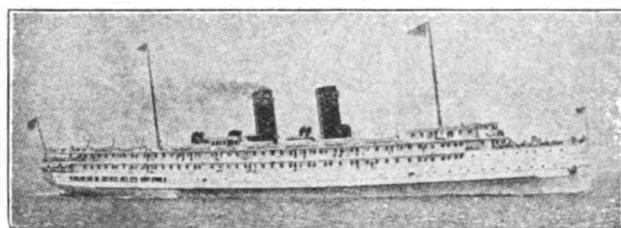
MODERN MARINE BOILERS and STEEL SHIP BUILDING



TUGS, PASSENGER STEAMERS
and SPECIAL CONSTRUCTION

WRITE
JOHNSTON BROTHERS
FERRYSBURG, MICHIGAN

PARSON'S MARINE TURBINES



TURBINE STEAMSHIPS YALE AND HARVARD

W. & A. FLETCHER COMPANY, Hoboken, N. J.

Marine Engines, Boilers
and Machinery of All Kinds

Contractors for
Vessels Complete

The Clothel Company

MANUFACTURERS OF

Low Pressure

REFRIGERATING MACHINES

Marine Work a Specialty

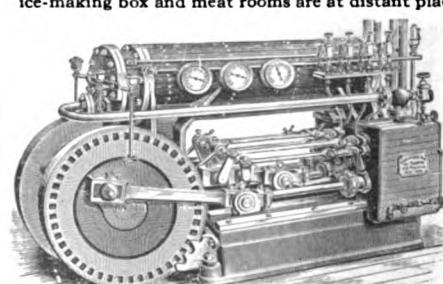
Office:

90 West Street

- NEW YORK, N. Y.

The Allen Dense-Air Ice Machine

contains no chemicals. It is placed in the engine room, while the ice-making box and meat rooms are at distant places of the steamer.



Over two
hundred in
daily service
in the tropics
on men-of-
war, steam
yachts and
mercantile
steamers.

H. B. ROELKER, Designer and Manufac-
turer of Screw Propellers
41 Maiden Lane NEW YORK

Please mention THE MARINE REVIEW when writing to Advertisers

LARGEST FLOATING DRY DOCK EQUIPMENT ON THE PACIFIC COAST

Completely Equipped Shops for Ship, Engine and Boiler

REPAIRS

Ship Builders, Engine Builders, Boiler Makers, Iron Founders, Brass Founders, Lumber Manufacturers

PARSONS' MARINE STEAM TURBINES—YARROW BOILERS

Cable Address: "THREEDOCKS"—Codes: Western Union, A. B. C., 5th ed. and Bentley's

Seattle Construction & Dry Dock Company
SEATTLE, WASHINGTON

BATH IRON WORKS
LIMITED

BATH, MAINE

Shipbuilders and Engineers

Licensee for
Parson's Marine Turbines,
Normand Express Water Tube Boilers.

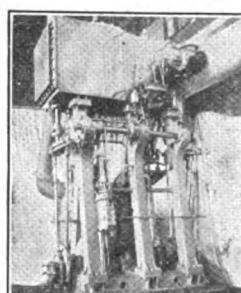
Particular Attention Given to
High Speed Requirements
Estimates Furnished.

**ST. LAWRENCE MARINE
RAILWAY COMPANY**
OGDENSBURG, N. Y.

Carriage accommodates every ship of
Welland Canal size.

Fully equipped for repairs to Wood
and Steel boats.

BOILER AND MACHINE SHOP
HIGH CLASS WORK



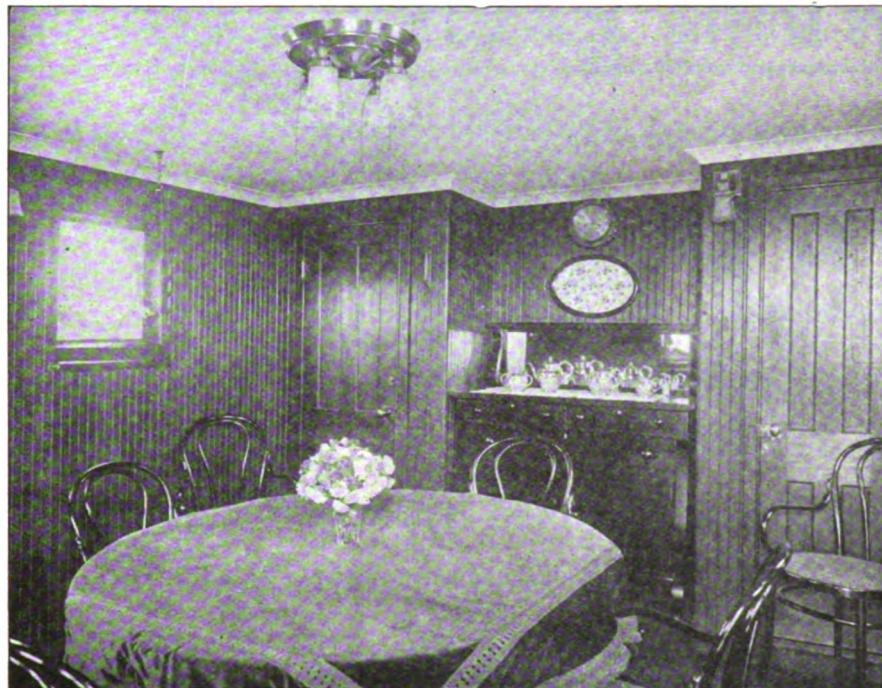
**STEEL SHIPS
ENGINES
MARINE BOILERS**

Manitowoc Shipbuilding & Dry Dock Co.
MANITOWOC, WIS.

Please mention THE MARINE REVIEW when writing to Advertisers

BYERLYTE DECK FLOORING

The only successful composition flooring for ships



Diningroom of the Steamer Underwood of the Erie Railroad
Lake Line covered with Byerlyte

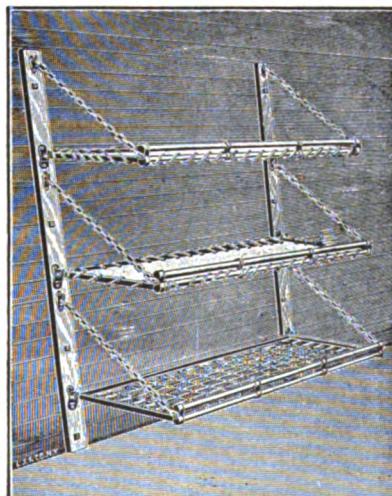
Vessel owners are recognizing the wonderful adaptability of Byerlyte deck flooring for ships. It absolutely will not crack; it binds perfectly with either wood or steel; it is waterproof, fireproof and vermin-proof; it is entirely mineral, is indestructible and will wear forever.

Vibration cannot break its surface

BYERLEY & SONS
CLEVELAND

Estimates given on request

The Southern Bedding Company
BALTIMORE, MD.



No. 1 ROMELINK BERTH (Open)

MANUFACTURERS OF

**Metal Berths and Bunks
of Every Description**

Illustrated Catalog upon request

SOUTHERN BEDDING COMPANY
BALTIMORE, MD.

SHEET PACKING



There are many kinds of sheet packing. Some kinds give service for but a short time. These, regardless of cost, are expensive.

Other kinds give long service—profitable service. These, if bought at a reasonable price, are economical.

N.B.O. Sheet Packing

is the Economical kind of sheet packing. It is the "cheapest per year" sold, because it gives you the most service for your money.

"N. B. O." is unequalled as a joint packing, not only on steam lines, but also on ammonia, gas, oil and alkali.

We'll be glad to send you a sample piece large enough for you to give it a satisfactory trial.

Write today for our illustrated catalog

HOME RUBBER Co.
TRENTON, N. J.

Please mention THE MARINE REVIEW when writing to Advertisers

Satisfied Customers Our Best Salesmen

E.L. Hutchinson

W.H. McLean

Hutchinson & Co.,
Lake Transportation
404 Leader News Building.

Office Telephone No. Main 2153
Residence: E.L. Hutchinson, Hotel 344
W.H. McLean, Bedford 274

Cleveland, O. Jan 5 1916

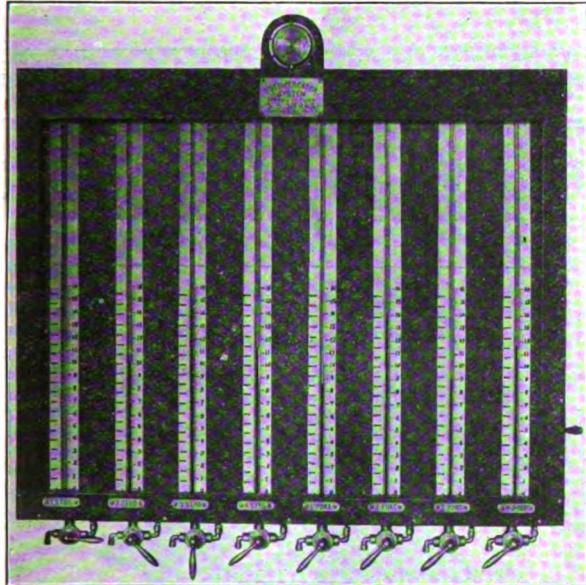
Mr Alex Hynd
Rockefeller Bldg
Cleveland Ohio

Dear Sir:-

You installed on the Steamer E L PIERCE early in 1915 a pneumercator and we beg to advise that from the reports received from the Captain and Engineer we are satisfied that it satisfactorily does the work for which it is intended; that is, - it properly records in the Captain's room the draft of the vessel at all times, while in the Engine rooms it properly records the amount of water in each of the tanks.

We therefore take pleasure in recommending it from both the standpoint of safety and economy.

Yours truly,

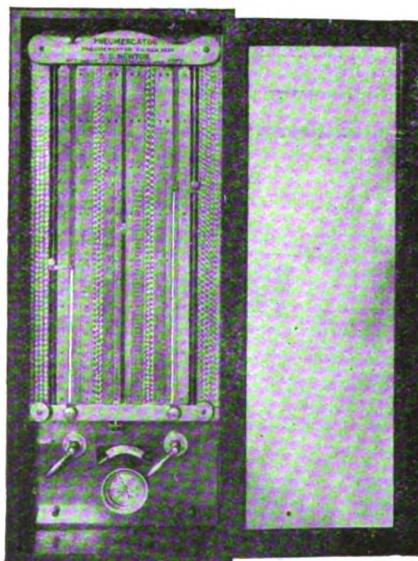


MODEL T-I

Located in Engine room indicates depth and volume or weight of contents of fuel oil or ballast tanks.
THE ENGINEER CAN THROW AWAY HIS SOUNDING RODS.

60 days free trial under our iron clad guarantee

Each Model
received a
**GOLD
MEDAL,**
The
Highest
Award
at the
Panama-
Pacific
Exposition



MODEL D-I

Located in Pilot House indicates fore, midships and aft drafts—also trim and list.
THE CAPTAIN CAN LOAD TO CAPACITY DAY OR NIGHT REGARDLESS OF WEATHER CONDITIONS.

PNEUMERCATOR COMPANY, Inc.

118 Liberty Street, New York
OR

ORLANDO SUMNER
4 Bedford Chambers
Covent Garden, London

ALEXANDER HYND
872 Rockefeller Building
Cleveland, Ohio

G. E. LAWRENCE
Bullitt Building
Philadelphia, Pa.

J. C. H. FERGUSON
Monadnock Building
San Francisco, Cal.

Please mention THE MARINE REVIEW when writing to Advertisers



Salt air and severe weather conditions make the selection of paint an important consideration.

DIXON'S SILICA GRAPHITE PAINT

for smokestacks, steel masts, iron hatchways, interior of hulls and in fact upon all exposed metal and wood surfaces. Tell us about what needs painting and ask for booklet No. 77-B.

Joseph Dixon Crucible Company
Jersey City, N. J.
Established 1827

B-100



For Every Part
of Every Ship

B. P. S.

Trade Mark Registered

Best Paint Sold



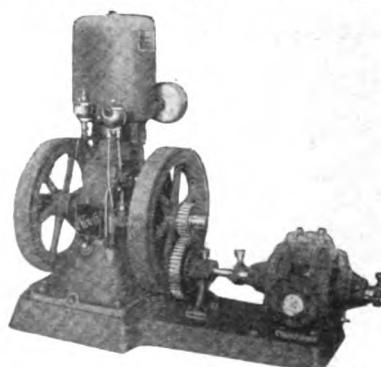
MARINE PAINTS

For the sake of appearance, service and economy use B. P. S. Marine Paints.

You'll be very pleased with results. Write our nearest branch for full information and prices.

The Patterson-Sargent Co.
Cleveland Chicago New York

Can You Beat This With Your Bilge Pump?



By using Blackmer you have a pump for fighting fire and washing decks as well as bilge work.

We specialize in Bilge pumps and guarantee them to please you.

They are not an experiment as they have been in actual use for now upwards of nine years.

A letter from any of our customers will prove to you they are superior.

All pumps have but five working parts.

No springs.

Wear automatically taken up.

Priming not necessary.

BLACKMER ROTARY PUMP COMPANY PETOSKEY, MICH.

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Johns-Manville



COVERS THE CONTINENT

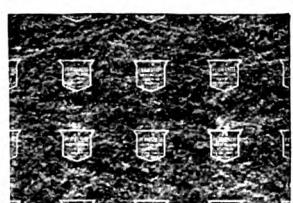
Serves more people in more ways than any institution of its kind in the world.

H. W. JOHNS-MANVILLE CO.

Akron
Albany
Atlanta
Baltimore
Birmingham
Boston
Buffalo
Chicago
Cincinnati
Cleveland
Columbus
Dallas
Dayton
Denver
Detroit
Duluth
Galveston
Houghton
Houston
Indianapolis
Kansas City
Los Angeles
Louisville
Memphis
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Minneapolis
Nashville
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Philadelphia
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Portland
Rochester
St. Louis
St. Paul
Salt Lake City
San Diego
San Francisco
Seattle
Syracuse
Toledo
Tulsa, Okla.
Washington
Wilkes-Barre
Youngstown

THE CANADIAN
H. W. JOHNS-MANVILLE
CO., LIMITED

Toronto
Montreal
Winnipeg
Vancouver



J-M Permanite

KNOWLEDGE of equipment sets the pace—

We often hear about "the man behind the throttle." But more than mere handling the throttle is necessary in the management of an engine room. The marine engineer must know equipment—that it is of proven serviceability and that it is backed up by recognized business stability.

J-M Responsibility, backed by J-M Service, stands behind every J-M product. J-M Service "Covers the Continent" and is available everywhere. Take advantage of it in your equipment purchases.

They actually improve plant efficiency—J-M Sea Rings

When you pack a rod or plunger with ordinary packing, you must make the stuffing box leak-proof against the greatest pressure to which it will be subjected, regardless of the fact that in all machines whether engine, compressor or pump, the actual fluid pressure against the packing varies during each stroke.

In other words there is a constant power loss as well as rod and packing wear due to this constant, maximum packing pressure, a great part of which is pure waste.

It is by correcting these evils that the automatic action of J-M Sea Rings saves packing wear, rod wear and frictional power losses—because they are actually operated by the fluid pressure behind them. They pack just as tight as necessary—no more—no less and regardless of the pressure or its variation.

You can improve every rod in your engine room by adopting this packing and spend the time you formerly spent on shut-downs on more valuable work. Write—right now to any branch and get all the facts.

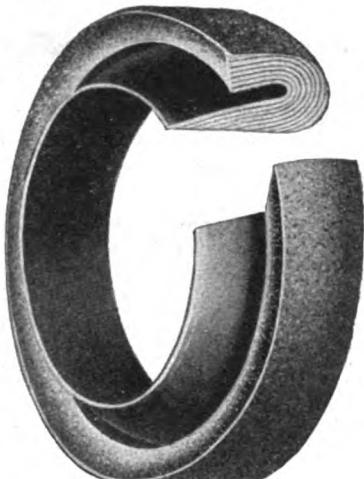
Here's a "tough" proposition in Sheet Packing—J-M Permanite

It's good for steam—has great pliability, heat-resisting and resiliency qualities. It's good for ammonia and acidulated solutions.

There is nothing in Permanite construction that is affected by any of those things that are ruinous to other packings.

It is the only successful result of combining the features and advantages of rubber and asbestos into one single packing.

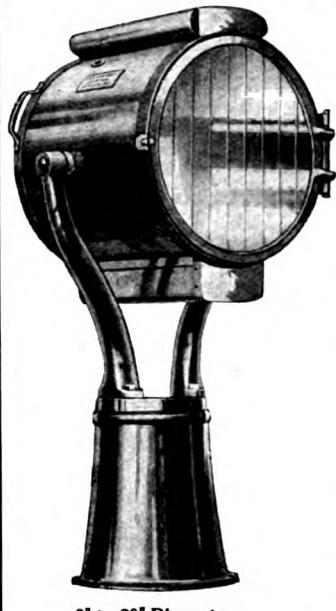
It's tough—will not squeeze out, burn out or stick to flanges. It is a sheet for **all** conditions—which means that you need not carry a large stock of different packings; and it is very light in weight. Why not enlist in the army of Permanite Users?



Service and Responsibility

Please mention THE MARINE REVIEW when writing to Advertisers

SEARCH LIGHT PROJECTORS



8" to 20" Diameter

Manufactured by

ENGBERG'S ELECTRIC & MECHANICAL WORKS

No. 6 Vine St., St. Joseph, Michigan

Engberg Search Lights
have been developed
to a stage of perfection.

The descriptive
bulletin will prove to
you why they are
superior to other
lights.

The prices are very
attractive, while the
iron-clad guarantee
assures you of entire
satisfaction.

Send your requirements.

MECHANICAL AND ELECTRICAL SHIPS TELEGRAPHS



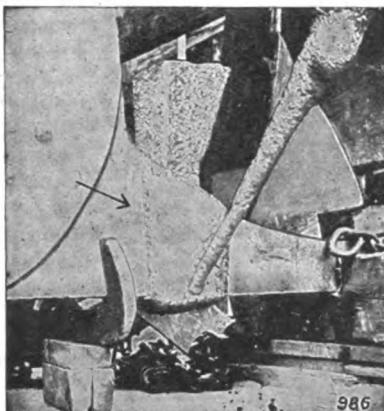
Rudder Indicators

Shaft Speed
IndicatorsElectric Whistle
OperatorsElectric Lighting
Equipments,
Fixtures, Etc.Electric and
Mechanical BellsAnnunciators,
Alarms, Etc.Loud Speaking
Marine Telephones

Installations

Chas. Cory & Son, Inc.

290 HUDSON STREET, NEW YORK CITY



Thermit Weld on Sternpost of Steamship
"William Henry Mack"

Quick Marine Repairs

Thermit Welding is quick, easy and effective—and when applied to broken rudder frames, stern-posts, or stern-frames, will enable your vessel to return to service in two or three days, effecting a tremendous saving in dry dock charges.

There is nothing experimental about Thermit Welding. During the last few years we have executed many repairs for the principal steamship companies of the Atlantic and Pacific coasts and the Great Lakes and every repair has been uniformly successful and our best advertisement.

Our process is sanctioned by the British Corporation for the Survey and Registry of Shipping, Glasgow.

If you are interested obtain our pamphlet No. 3440 and Reactions, which illustrate and describe many marine repairs and contain full information about the process. Every marine man should have one.



GOLDSCHMIDT THERMIT COMPANY

WILLIAM C. CUNTZ, Gen. Mgr.

90 West Street, New York

432-436 Folsom St., San Francisco 7300 So. Chicago Ave., Chicago
103 Richmond St., W., Toronto, Ont.



Holding the Records in the Navies of the World

The records for Economy, Capacity and Endurance in the Navies of the World, are held by

BABCOCK & WILCOX FORGED STEEL

Marine Water-Tube Boilers and Superheaters

Moreover, the same superior characteristics have been proved in the Merchant Marine.

Do you know that Babcock & Wilcox Boilers and Superheaters in one vessel are saving more than 15 per cent over Scotch boilers in sister vessels?

Isn't such a great reduction in coal bills of very great interest to you?

All essential parts of Babcock & Wilcox Boilers are heavier than the corresponding parts in Scotch boilers, thus giving greater security against corrosion.

Let us send you full details explaining why "Babcock & Wilcox" stands for safety, ease of cleaning and simplicity of operation.

A large portion of our business consists of "repeat-orders." You know what that means. *Write us at once.*

The Babcock & Wilcox Co.

NEW YORK and LONDON

Please mention THE MARINE REVIEW when writing to Advertisers

Freight Handling Machinery

Equipped for Electrical Operation



The General Electric Company is ready to help dock boards and city engineers increase the prestige of their ports by equipping any mechanical freight handling machinery they may select with electric motors and control equipment or to furnish the lamps for lighting the piers and bulkheads.

Many stevedoring firms, steamship companies and dock boards are greatly increasing dispatch and economy, while materially reducing accidents in their freight handling by the use of G-E equipment. Reductions in leakers result from the careful handling made easy by G-E control of movements. The greater cleanliness and dispatch obtains and holds for stevedoring firms the handling of packing house products and other profitable business.

Our engineers and salesmen have been following the electrical equipment of mechanical freight handling devices for years and can show remarkable results accomplished by equipment in use as well as many repeat orders resulting therefrom. We invite your investigation.

General Electric Company

Atlanta, Ga.
Baltimore, Md.
Birmingham, Ala.
Boston, Mass.
Buffalo, N. Y.
Butte, Mont.
Charleston, W. Va.
Charlotte, N. C.
Chattanooga, Tenn.
Chicago, Ill.
Cincinnati, Ohio

Cleveland, Ohio
Columbus, Ohio
Dayton, Ohio
Denver, Colo.
Des Moines, Iowa
Duluth, Minn.
Elmira, N. Y.
Erie, Pa.
Fort Wayne, Ind.
Hartford, Conn.
Indianapolis, Ind.

General Office: Schenectady, N.Y.
ADDRESS NEAREST OFFICE

Jacksonville, Fla.
Joplin, Mo.
Kansas City, Mo.
Knoxville, Tenn.



Los Angeles, Cal.
Louisville, Ky.
Memphis, Tenn.
Milwaukee, Wis.

Minneapolis, Minn.
Nashville, Tenn.
New Haven, Conn.
New Orleans, La.
New York, N. Y.
Niagara Falls, N. Y.
Omaha, Neb.
Philadelphia, Pa.
Pittsburgh, Pa.
Portland, Ore.
Providence, R. I.
Richmond, Va.

Rochester, N. Y.
St. Louis, Mo.
Salt Lake City, Utah
San Francisco, Cal.
Schenectady, N. Y.
Seattle, Wash.
Spokane, Wash.
Springfield, Mass.
Syracuse, N. Y.
Toledo, Ohio
Washington, D. C.
Youngstown, Ohio

For Michigan Business refer to General Electric Company of Michigan, Detroit.
For Texas, Oklahoma and Arizona business refer to Southwest General Electric Company (formerly Hobson Electric Co.), Dallas, Houston, El Paso and Oklahoma City. For Canadian business refer to Canadian General Electric Company, Ltd., Toronto, Ont.
Motor Agencies in all large cities and towns

5478

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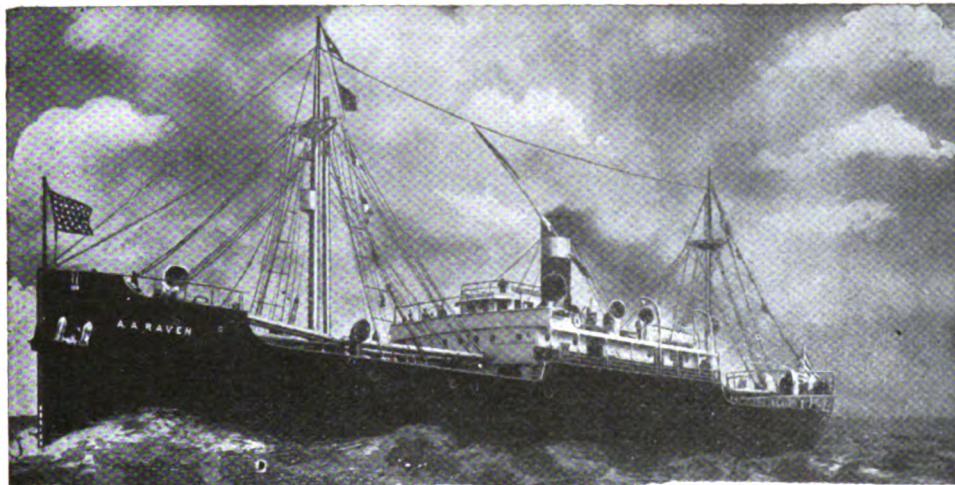
GREAT LAKES ENGINEERING WORKS

DETROIT, MICHIGAN

ANTONIO C. PESSANO
President and General Manager

JOHN R. RUSSEL
Vice President and Treasurer

H. W. HOYT
Vice President and Secretary



Four types of ships built by us
for Ocean and Coastwise service

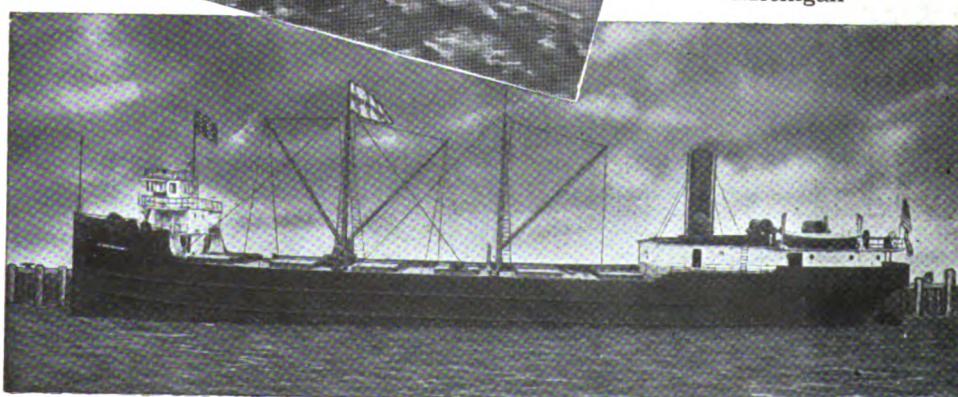


These vessels received certificates
of highest classification in British
Lloyds and the American Bureau of
Shipping

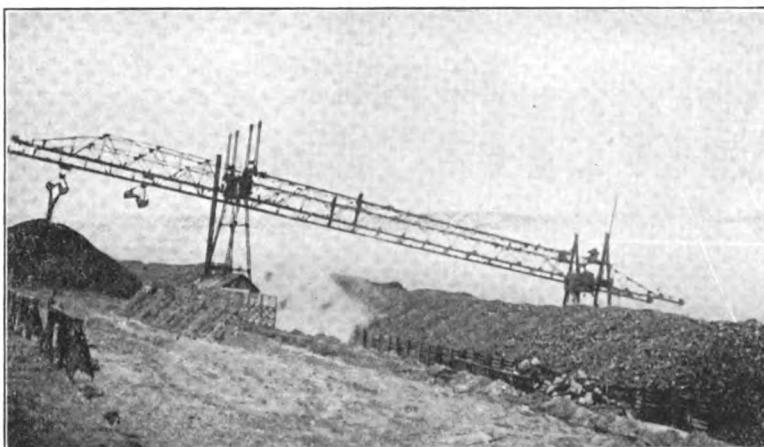
Ship Repairing Dry Docks of Largest Capacity

Ship Yards and Engine Works
at
Detroit and Ecorse
Michigan

Ashtabula
Ohio



Please mention THE MARINE REVIEW when writing to Advertisers



Two Ton Double Unloading and Stocking Bridges

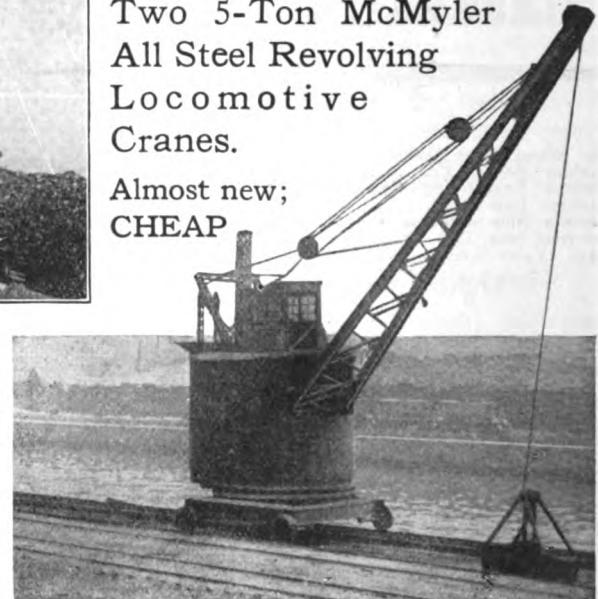
The above is a cut of a set of our unloaders in operation at the dock of James Playfair at Midland, Ontario. This is the third set James Playfair has purchased from us. We have several pairs of these Bridges for sale cheap.

**Locomotive Cranes—Whirleys
Clam Shell Buckets**

FOR SALE

Two 5-Ton McMyler
All Steel Revolving
Locomotive
Cranes.

Almost new;
CHEAP



THE CLEVELAND & ERIE MACHINERY COMPANY
ROCKEFELLER BUILDING
CLEVELAND



New HOTEL TULLER

Detroit, Michigan

Center of business on Grand Circus Park. Take Woodward car, get off at Adams Avenue

ABSOLUTELY FIREPROOF

200	Rooms, Private Bath,	\$1.50	Single,	\$2.50	Up Double
200	" " "	2.00	"	3.00	" "
100	" " "	2.50	"	4.00	" "

Total 600 Outside Rooms

ALL ABSOLUTELY QUIET

Two Floors—Agents'
Sample Rooms

New Unique Cafes and
Cabaret Excellent

AMERICAN LINE

The Only Trans-Atlantic Steamers Under
the American Flag

FAST EXPRESS SERVICE

NEW YORK

LIVERPOOL

Sailing from New York
Every Saturday
at 12 noon

St. Louis

St. Paul

New York

Philadelphia

9 BROADWAY, NEW YORK
Pier 62, North River, Foot of West 23rd St.,
New York

1319 Walnut St., Philadelphia
India Bldg., 84 State St., Boston
1306 F St., N. W., Washington
219 St. Charles St., New Orleans
14 N. Dearborn St., Chicago

Northwest Corner 11th and
Locust Sts., St. Louis
121 South Third St., Minneapolis
319 Geary St., San Francisco
619 Second Ave., Seattle
41 King St. East, Toronto
118 Notre Dame St., Montreal

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Classified Advertisements

Wanted and For Sale

RATES

All Classified Ads.—four cents (4c) per word. No advertisements accepted for less than \$1.00.
Remittance should accompany order for one-time ads.

IMPORTANT

Seven (7) words must be allowed for box address.
To insure insertion, copy should reach us before the 9th
of the month.

Positions Wanted

POSITION WANTED AS MASTER
mechanic, chief electrician or superintendent
Coal or ore handling plants, at present in
charge of one of the largest and most modern
coal handling plants in the country. Specialist
in the application of electric power and control
devices and know the Hulett Electric
Unloaders from A to Z. Address Box 115,
THE MARINE REVIEW, Cleveland, O.

LOFTSMAN, WANTS POSITION; HAS
30 years ship yard experience; wood or steel;
16 years mold loft in Great Lakes and Coast
yards. Address Box 121, THE MARINE
REVIEW, Cleveland, O.

For Sale

Clarence L. Parker, Vessel Agent,
Foot of First Street,
Detroit, Mich.
Sells and Buys Boats of every class and type.

FOR SALE ON EASY TERMS OR WILL
trade Tug Cadillac, perfect condition, allowed
125 lbs. steam. Charles Ryan, 4 Birge Bldg.,
Buffalo, N. Y.

FOR SALE:—LOCOMOTIVE CRANES,
McMyler revolving derricks, with clam shells.
The Cleveland & Erie Machinery Co., Rockefeller
Bldg., Cleveland, O.

THE OWNER OF THE CHOICE MILWAUKEE
built, 300 ft. freight steamer Thomas
Davidson (3,500 tons coal) retiring management
now offers her for sale. Also the barge
Baltic, about seventy thousand corn or wheat;
twelve hundred thousand lumber capacity;
large repairs recently. Towing machine, new
cable, pumps, etc. Best offer takes them. H. J. Pauly, 165 Eighteenth St., Milwaukee, Wis.

FOR SALE:—SEVERAL VESSELS, ALL
kinds and sizes; steam yachts, with speed exceeding
35 miles per hour; all in good condition and bargains. Prices, descriptions, etc.,
may be secured by addressing Box 100, THE MARINE REVIEW, Cleveland, O.

FOR SALE:—TWO SCOTCH MARINE
boilers. Now on the dock of the Great Lakes Engineering Works, at Ecorse. These
boilers are about 13 feet diameter and length and were allowed 125 lbs. steam when last
inspected. Write O. W. Blodgett, Duluth, Minn.

FOR SALE:—COARSE FREIGHT
steamer, 1,000 tons capacity, and two barges, 1,200 tons each. All in first-class condition and carry highest Great Lakes rating. Address Box 112, THE MARINE REVIEW, Cleveland, Ohio.

FOR SALE WOODEN STEAMER WIN-
nipeg lumber capacity 1,100,000 feet, coal 1,700 tons. Rebuilt recently. Address D. H. Andrews, Ellicot Sq., Buffalo, N. Y.

FOR SALE:—SCHOONER J. H. MEAD,
388 tons net, will carry 400 M. hardwood—
550 M. pine. Rebuilt lately. First class condition. Capt. A. Thompson, 3708 McLean Ave., Chicago, Ill.

For Sale

FOR SALE:—CAR FERRY; CAN BE converted into sand sucker. Dimensions of ferry are 264 feet long, 53 feet beam, 14 feet depth. The rail above main deck is 8 feet high and upper four feet being of steel consisting of 4 plates, 24 inches wide by $\frac{3}{4}$ inch thick extending under bow and stern making complete arch full length across. Also strip of steel in deck, each side, 3 feet wide. The hull has combination steam windlass and capstan, 2 anchors and chains and Williamson steam steering gear. Can be seen at Manistee Iron Works, Manistee, Mich. Address A. W. Towsley, V. P. & G. M. Ann Arbor Railroad Co., Toledo, O.

FOR SALE:—STEEPLE COMPOUND
Engine 7x14x12. Wheel shaft and bearings. One tubular marine boiler 10 ft. long, 48 in. diameter. Address L. Hohmann, 2457 East Wood Ave., Chicago, Ill.

FOR SALE:—STEAMER MOHEGAN IN thorough condition throughout; rates 95 high power; two new Scotch boilers 11 ft. 6 in. x 14 ft. 6 in.; steel boiler house; recently in dry dock; will run 12 miles an hour light or loaded; capacity 1,200 M. ft. lumber; 1,600-1,700 tons coal. Also for sale, consort Mingoe, light draught, good condition, capacity 950 M. ft. lumber, 1,200-1,300 tons coal. Address Graves, Bigwood & Co., Buffalo, N. Y.

FOR SALE:—FIRST CLASS LIGHT
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FOR SALE:—WOODEN STEAMER
Caledonia, 277 ft. x 42 ft. x 21 ft.; capacity about 3,000 tons; fore and aft compound engine, 24 in. and 44 in. x 42 in. stroke; Two Scotch boilers, 10 ft. diameter x 11 ft. long, for 130 pounds; may be seen at the Ecorse Yard of the Great Lakes Engineering Works, Detroit, Mich. Would make first-class tow barge and will be sold cheap. For further particulars apply 1304 Rockefeller Bldg., Cleveland, Ohio.

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FOR SALE:—GAS BOAT GLORIANA. Built in 1913. 62 ft. overall, 13 ft. beam, 6 ft. deep. 75-H. P. Kahlenberg engine. Speed 13 miles. E. G. Endress, Sault Ste Marie, Mich.

For Sale

PLANT FOR SALE:—ONE THREE
cubic yard dipper dredge; 1 Tug Boat, 13 x 15 cylinder, hull 40 feet x 13 feet x 6 feet; 3 derrick scows; 1 flat scow 76 feet x 24 feet x 7 feet 6 inches; 2 three hundred cubic yard mud scows; one $1\frac{1}{2}$ yard orange peel bucket; one $1\frac{1}{4}$ yard Williams clam shell bucket; one direct connected $\frac{3}{4}$ cubic yard concrete mixer; one marine lake type boiler 16 feet long, 9 feet in diameter, built for 145 pounds working pressure, heating surface 2,400 square feet. Great Lakes Construction Co., 1117 Chamber of Commerce building, Buffalo, N. Y.

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HULL AND MACHINERY STEAMER "Charles Eddy". Hull needs repairs but machinery very good. Boiler 170 lbs. steam. Hodge triple engine. Pony boiler. Providence steam windlass. New Globe steerer. Iron rudder. Steel mast. Just the rig for steel hull. Now at Milwaukee.

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SEABERRY—FLUSH DECK CRUISER. Length 71 ft., beam 12 ft. 6 in. Two 50-H. P. Speedway motors, speed 11 to 12 miles. Built for salt water or Florida cruising, fine sea boat.

Accommodations for 8 beside crew. State-room and main cabin finished in mahogany, bath, three toilets, electric lights, high class throughout.

Boat now in Detroit, price very reasonable. Address Cruiser, 1716 West Grand Blvd., Detroit, Mich.

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1—Double Drum Deck Engine.
1—Steam Capstan.
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FOR SALE—HEAVY DUTY TOW BOAT, first-class condition at a bargain. Also four decked over barges. For particulars, address "S" 1023 N. Spring St., Pensacola, Fla.

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FOR SALE: — STEAMER THISTLE Cheap, if taken at once. Inquire Hart Transportation Co., Sturgeon Bay, Wis.

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Also one steam outfit, triple engine, 8-10-18, 12 inch stroke, complete with shafting surface, condenser, pumps and almy water tube boiler. W. D. Bennett, Bucksport, Me.

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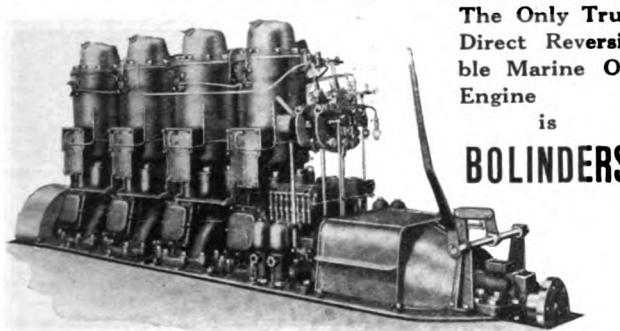


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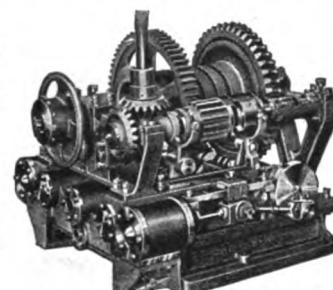
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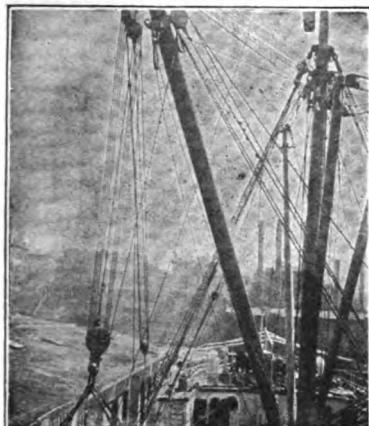
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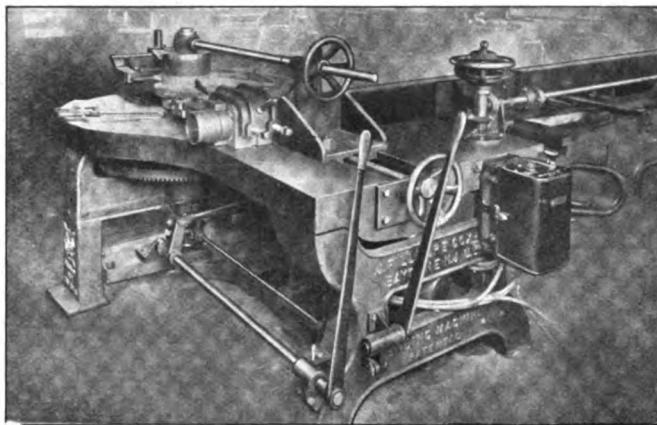
The ladder can be compactly rolled up for storage.

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The Brown Steamship Company, Cleveland.

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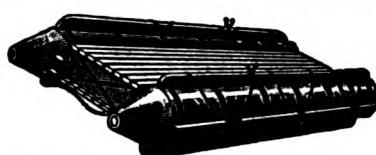
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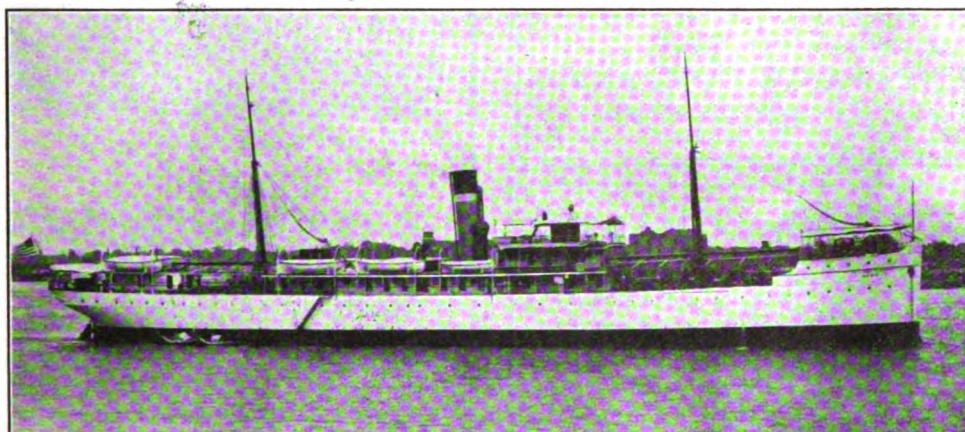
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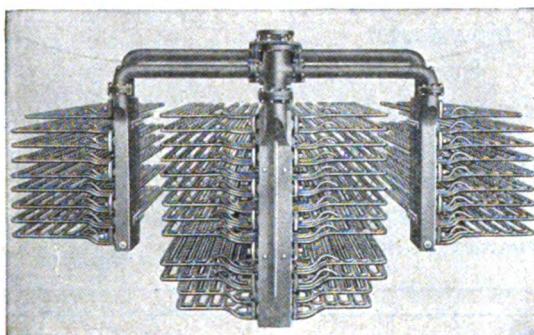
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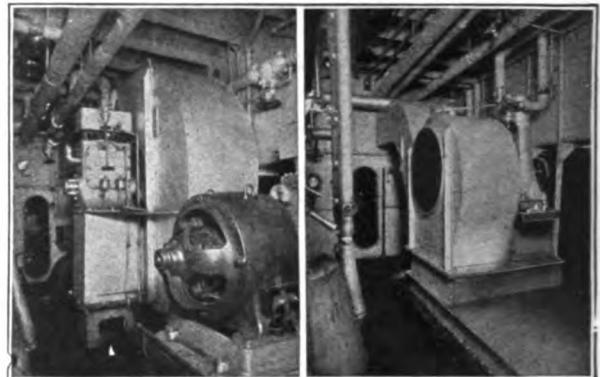
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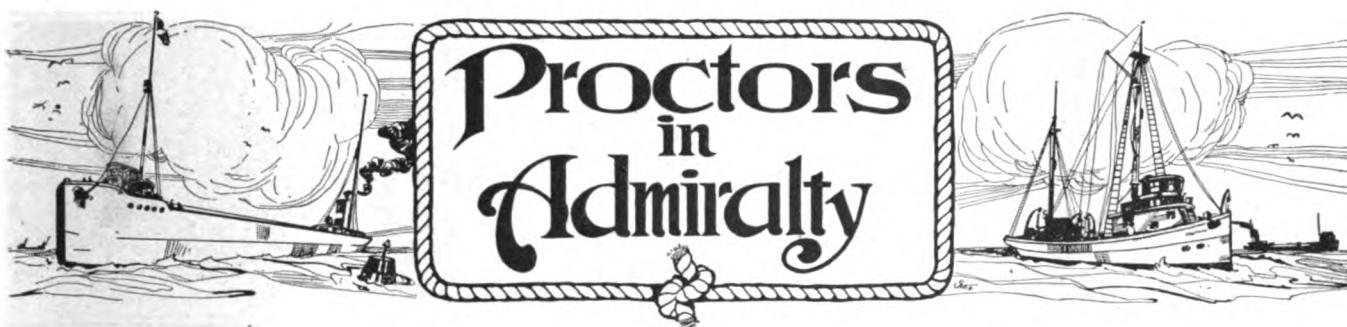
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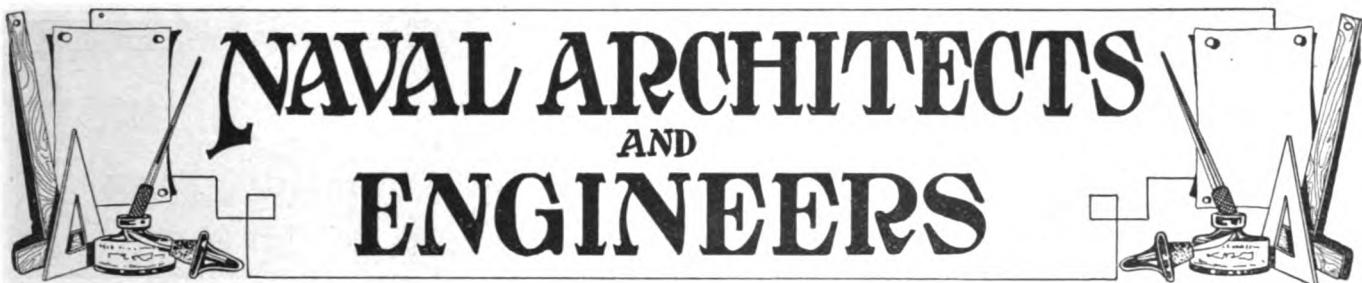
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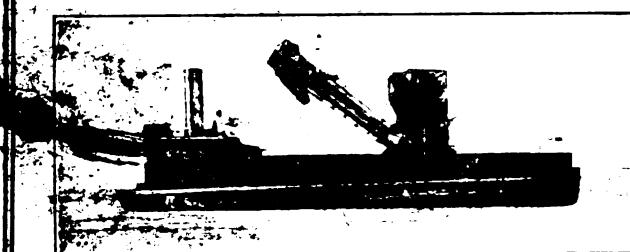
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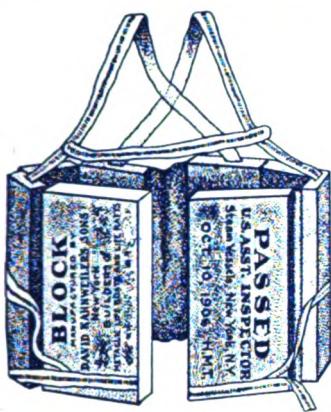
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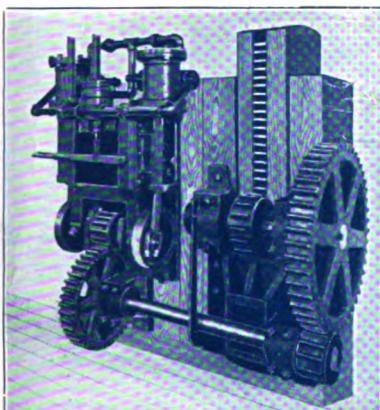
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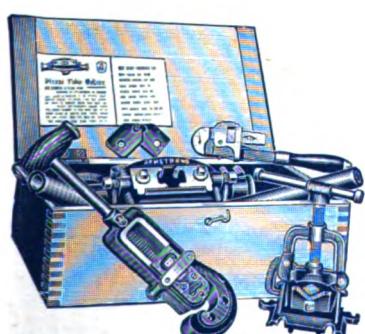
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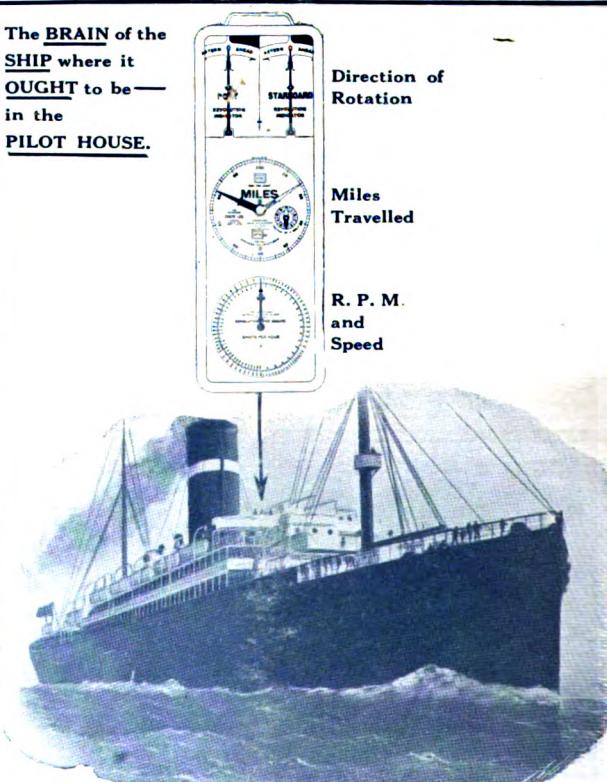


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VOL. 46

CLEVELAND

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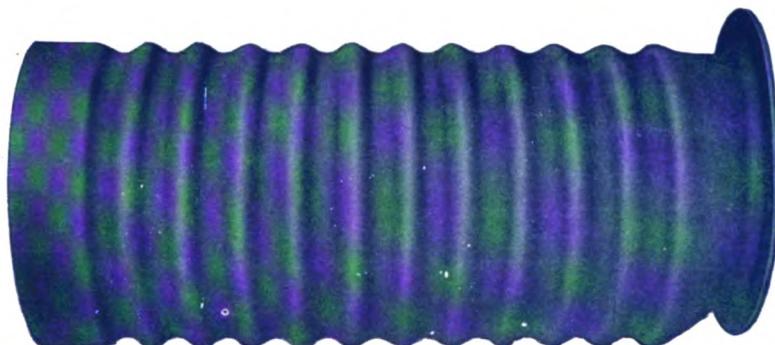
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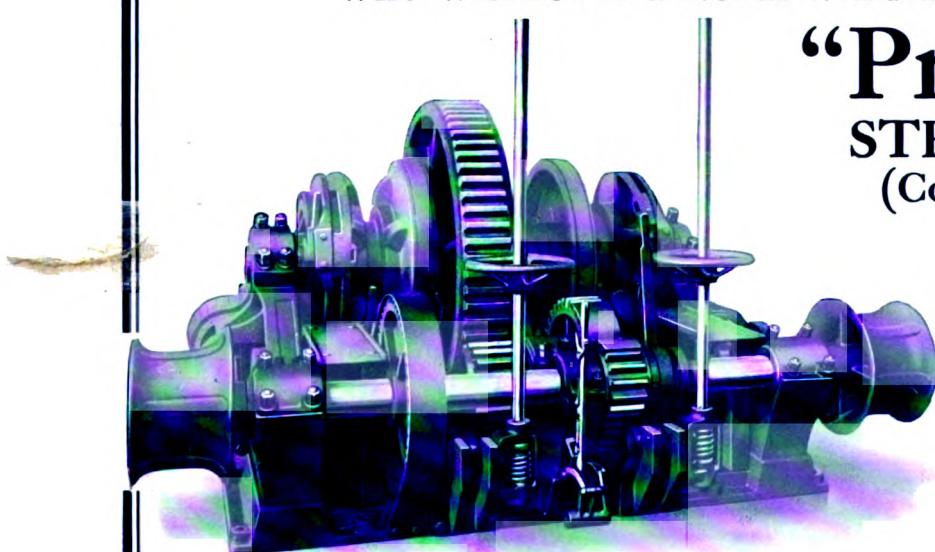
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